Bank IT Job Exams · BSCS / Bangladesh Bank

Non-Technical Part: Math · English · GK · Bangla

For Assistant Programmer, Senior Officer (IT), Officer (IT), AME / AE (IT) exams

All past non-tech questions solved | Arithmetic · Time-Speed · Algebra | Grammar · Focus · Translation | Bangla grammar | Stable GK | 2 model tests | −0.25 strategy

Next exam: BSCS Assistant Programmer (Job ID-25106) · 31 October 2026 · MCQ 25 + Written 50 non-tech marks

Contents and Exam Analysis

Chapter	Topic	Why	Page
0	Contents, non-tech marks in every bank IT pattern, past-paper analysis, strategy, 2-day plan	Know what comes and where marks are easy	–
1	Arithmetic: percentage, profit–loss–discount, ratio, average, simple and compound interest	Largest share of the 15 math MCQs; 1–2 written problems every paper	–
2	Time and work, pipes, speed–distance, trains, boats and streams	Boat (AP 2026), train and work MCQs (Officer IT 2026)	–
3	Algebra, surds, sets, geometry and mensuration, counting and probability	x + 1/x, surds, sets, dice, handshake — all came in past papers	–
4	English grammar and vocabulary	10 grammar items in the AP written (30 marks part) + English MCQs	–
5	Written English: Focus Writing, paragraph, letter, translation	Paragraph/Focus/letter/translation in every written paper	–
6	Bangla: grammar MCQ, Bangla Focus, translation	Officer IT / SO IT papers have Bangla MCQ and Bangla Focus	–
7	General knowledge: Bangladesh, banking, international, ICT	10 MCQ marks (AP) or 10 written marks (SO/Officer IT)	–
8	Model Tests 1–2 and last-night checklist	Practise against the clock with full solutions	–

0.1 Non-technical marks in every known bank IT exam pattern

The patterns below come from the source compilations (candidates' memory; not official). Where the compilation's numbers do not add up, they are shown "as compiled".

Exam (tag used in this book)	Non-tech in MCQ	Non-tech in written	Non-tech total
BSCS AP, Job ID-25106, 31.10.2026 (circular)	Math 15 + GK 10 = **25 / 100** (−0.25 each wrong)	Math 20 (usually 4 × 5) + English Language Proficiency 30 = **50 / 200**	**75 / 300**
BSCS AP 17.01.2026 (BIBM/CTI) AP 17.01.2026	Math + GK 25 (as compiled)	4 math (20) + English 30: 10 grammar items, 1 paragraph, sentence making (5 words)	≈ 75
BSCS AP 31.10.2026 (Job ID-25106) AP 31.10.2026	Math 15 + GK 10 (−0.25)	4 math (20) + English 30: 10 grammar items (10), essay (20)	≈ 75

Screening MCQ 2026, Set-3 (header appears to read Payra Port) Screening MCQ 2026	English 20 + Bangla 20 + GK 19 + Math 1 = **60 / 100** (−0.50 each wrong)	—	60 (MCQ only)
BSCS AP / Officer (IT) 03.01.2026 AP 03.01.2026	—	Bangla essay + English essay + translation B→E + E→B + 10 GK questions (= 50); IT 15 × 10 = 150	50 (written)
Combined 5 Bank AP 03.02.2023 (BIBM) Combined 5 Bank AP 2023	Math/GK 25 of 80 MCQ (as compiled)	Math 20 + Focus 10 + translation 20 = 50	≈ 75
Bangladesh Bank AP 03.02.2023 (BIBM) BB AP 2023	MCQ 80, 1 hour (split not given)	4 math (20) + Focus 10 + translation B↔E 20 = 50	50+
Combined 5 Bank AP 09.02.2024 (BIBM) Combined 5 Bank AP 2024	Math + GK 20 of 80 MCQ (as compiled)	4 math (20) + Focus 20 + Letter 10 = 50	≈ 70
Bangladesh Bank AME / AD (ICT) 04.02.2023 BB AME 2023	—	4 math (20) + translation 20 + Focus 10	50 (written)
BSCS AE (IT) / AME 24.01.2026 BSCS AME/AE 24.01.2026	—	2 math (probability, handshake) + 2 translations (10 + 10) + 1 Focus ("Data is the new compute in today's AI era")	≈ 40–50
BSCS Senior Officer (IT), Job ID 25104, 25.07.2026 SO IT 2026 (25104)	Separate MCQ stage	Focus Bangla 10 + Focus English 10 + translation B→E 10 + E→B 10 + GK 10 = **50**	50 (written)
BSCS Officer (IT), Job ID 25105, 31.07.2026 Officer IT 2026 (25105)	1 hour: English, Bangla, GK, Math + IT	Same as SO IT: 50 (language + GK)	50 + MCQ share
Combined Bank Officer (IT) MCQ 03.01.2026 (BIBM) Officer IT MCQ 2026 (BIBM)	99 questions: ~60 IT, ~39 Bangla + English + math + GK	—	≈ 40% of MCQ
BSCS Combined 2 Bank Officer (IT) 2020 BSCS Officer IT 2020	—	Essay + translation B→E, E→B + English passage	—
ANSE 2026 (25109), AME/AE 08.05.2026	—	Only technical questions reported	0 reported

What this table tells you

1. **AP papers:** math is always there (4 × 5 written + MCQ). English changed from "Focus + translation" (2023) to "Focus + letter" (2024) to "grammar + paragraph + sentence making" (Jan 2026). The 31 Oct circular says "English Language Proficiency 30" — exactly the Jan 2026 form, so prepare that first, but be ready for a Focus or a letter.
2. **SO IT / Officer IT papers:** no written math, but Bangla Focus, translation both ways and 10 GK questions.
3. **Non-tech is about 25% of all marks.** Most candidates score about the same in IT; these 75 marks often decide the merit list.

0.2 What came in past papers

Mathematics

Paper	Questions (all solved in Chapters 1–3)
AP 17.01.2026	Rectangle and square of equal area (perimeter 32 m, width 4 m) · range of xy if 2 < x < 5, 3 < y < 5 · boys 35% more than girls, total 94, +6 boys → ratio · rowing 12 km/h, upstream takes 3 times as long → stream speed
AP 31.10.2026	Pipes A, B fill and C empties (10, 15, 12 h) · product of two consecutive odd numbers = 143 · 4 per bench → 3 benches empty, 3 per bench → 6 stand · A:B = 3:4, B:C = 5:6, A gives Tk 5,000 → 1:2 (solved in 8.4)
BB AP 2023	Integer x with $x + 1/x = 17/4$ → $x - 1/x$ · basketball 15 won, 9 lost, 16⅔% of season → wins needed for 75% · students in rows (+4 per row → 2 rows fewer; −4 per row → 4 rows more) · area of square PSRT (figure missing)
BB AME 2023	Surd: $4(\sqrt{6}+\sqrt{2})/(\sqrt{6}-\sqrt{2}) - (2+\sqrt{3})/(2-\sqrt{3})$ · Tk 25,000 split, CI 8% vs SI 10%, difference Tk 1,336 · profit % at Tk 1920 = loss % at Tk 1280 → price for 25% profit
BSCS AME/AE 24.01.2026	Probability of at least one defective (25% defective rate) · handshakes among 10 engineers
Officer IT 2024	Two dice, sum 7 · find sets X and Y from $X \cup Y$, $X \cap Y$, $Y - X$
Officer IT MCQ 2026 (BIBM) / Officer IT 2026 (25105)	MCQ: 20% discount still 20% profit → mark-up · ladder (3-4-5) · open box surface area · HCF 12, LCM 288 · train through tunnel · trucks meeting · factor $4x^4 + 1$ · $x + 1/x = 7 \rightarrow x^2 + 1/x^2$ · hexagon angle sum · xy from x + y, x − y · work together (6 and 10 days) · bridge crossing · two coins, one head · $2^{x+3} = 32$

English

Paper	Questions (solved in Chapters 4–5)

AP 17.01.2026	10 grammar items: third conditional · future perfect ("By next month") · Hardly … had … when · "as well as" agreement · had better + base verb · however vs for example · a unanimous · result in · "one of the scholars who advocate" · insist that + subjunctive. Paragraph: *Street Food Culture in Dhaka*. Sentence making: judicious, condone, fabricate, accentuate, multifaceted
AP 31.10.2026	10 items: past perfect ("By the time we arrived") · good at · neither…nor agreement · noun of decide · I wish I were · Hardly had I … when · present perfect passive · indirect yes/no question with tomorrow · meticulous · despite + noun · essay (20): Job prospects in the age of AI (solved in 8.4)
Screening MCQ 2026	20 MCQs: commemorate, dream of, mind + gerund, call at, prefer … to, good at, stand by, look forward to + gerund, as if + past perfect, no sooner … than, it is high time + past, curator, pallbearers, variful, through thick and thin, To Autumn (Keats), Diarrhoea (solved in 8.5)
AP 03.01.2026	English essay: *Online Banking* · translation B→E (Google Drive passage) · E→B (fertilizer crisis passage)
BB AP 2023	Focus: *Growing Use of Technology in the Financial Service Industry* · E→B passage "Global economic turbulence…"
Combined 5 Bank AP 2024	Focus (20) + Letter (10) — topics not recorded in the compilation
BSCS AME/AE 24.01.2026	Focus: *Data is the new compute in today's AI era* · 5 sentences B→E (strict policies, transparency, corruption, drizzling since morning, advice) · 5 sentences E→B (Empty vessels sound much, online banking, waive service charge, nascent stage, true greatness)
SO IT 2026 (25104)	Focus (English): *The Importance of Digital Literacy in Expanding Cashless Transactions in Bangladesh* · passage "pull out of the agreement at the eleventh hour"
Past bank IT MCQs (source table 14.4)	Passive of "Pluck me a flower" · antonym of segregate · "With opportunity comes responsibility" · adjective clause · misspelt "jewelery" · "Bread and butter is" · "committee" · tags "shall we" / "does he"

General knowledge

Paper	Questions (answers in Chapter 7)
Screening MCQ 2026	2nd largest seaport · largest country of South America · largest gas field · first parliament election · Kyoto Protocol · UNICEF/UNDP HQ · COP-31 · FIFA 2034 · smallest UN member · red planet · CEDAW · WWII UK PM · UN Charter in force · lungs of the earth · persona non grata · BIMSTEC chair · Chancellor (solved in 8.5)
AP 03.01.2026 (10 written)	First earthquake observatory · WIPO full form · VAT introduced · first bank of Bengali entrepreneurs · CIRDAP HQ · inventor of dynamite · ITTF World Championships 2025 men's singles · OSI layers · meaning of terracotta · GSP+ granted by

SO IT 2026 (25104)	NPSB full form · architect of the National Martyrs' Memorial · central bank of the UK · publisher of World Economic Outlook · first submarine cable
Officer IT 2026 (25105)	Global health body · first deep sea port · IMF HQ · longest coastline · Rabindranath's Nobel year · coral island · SAARC HQ · "Clearing House" · first private commercial bank · 8086 bits
Officer IT MCQ 2026 (BIBM)	Tin Bigha Corridor district · Birishiri cultural academy · mercurous nitrite discoverer · first organisation of the Language Movement · International Literacy Day · first computer in Bangladesh

Bangla

Paper	Questions (solved in Chapter 6)
Screening MCQ 2026	20 MCQs: Rokeya, বঙ্গবাণী, বর্ণপরিচয়, শ্রীকৃষ্ণকীর্তন, আম আঁটির ভেঁপু, পথের দাবী, বীরবল, ডাকঘর, মুক্তিযুদ্ধের উপন্যাস, Fort William College, last medieval poet · দুরবস্থা, দক্ষ pronunciation, ভ্রমর কালো সমাস, মৌলিক স্বরধ্বনি, Phonology, বাগধারা, মতি, অনিবার্য (solved in 8.5)
AP 03.01.2026	Bangla essay: the role of youth in building a corruption-free country · E→B translation passage
SO IT 2026 (25104)	Bangla Focus: digital transformation of Bangladesh's banking sector under the Fourth Industrial Revolution · E→B passage
BSCS AME/AE 24.01.2026	5 sentences E→B, including the proverb "Empty vessels sound much"
Past bank IT MCQs (source table 14.4)	One word for "facing the eye" (pratyaksha) · antonym of "pratyay" (conviction → doubt) · part of speech of the negative "na" (indeclinable) · compounds "kane kalam" (Aluk Bahubrihi), "nilpadma" (Karmadharaya) · "sara" as adjective · sandhi of "pariksha" · conjunct letters of "tikshna"

> **Pattern in one line**
>
> Math = arithmetic word problems + one algebra identity + one probability/counting item. English = rule-based grammar (agreement, conditionals, inversion, subjunctive) + one paragraph/Focus on banking or a social topic. GK = Bangladesh firsts, banking bodies, international organisation HQs.

0.3 Strategy

Negative marking (−0.25): when to guess

Expected mark of a guess = p × 1 − (1 − p) × 0.25 ⇒ positive when p > 0.2

Situation (4 options)	Chance correct	Expected mark	Decision
Blind guess	1/4	+0.06	Skip — tiny gain, high variance
One option surely wrong	1/3	+0.17	Answer

Two options surely wrong	1/2	+0.375	Always answer
Math answer you computed but are unsure of	usually > 1/2	> +0.375	Answer (re-check by plugging in)

Traps

Do not guess on current-affairs GK you have never seen — options are often all plausible. Never change a calculated answer to a "feels right" option. Fill the OMR circle fully; a half-filled circle can be read as wrong.

Time split

Section	Marks	Time	How
MCQ — Subject	75	~40 min	Sure ones first, mark doubtful ones
MCQ — Math	15	~11 min	45 s each; if no method in 20 s, skip and return
MCQ — GK	10	~4 min	You know it or you don't — never spend long
MCQ — review + OMR	—	~5 min	Second round on marked items; check roll and set code
Written — Subject	150	~80 min	About 5–6 min per 10-mark question
Written — Math	20	~15 min	~4 min per 5-mark problem; do it right after the IT part while fresh, or first if math is your strength
Written — English	30	~22 min	Grammar 5 min → sentence making 5 min → paragraph 12 min
Written — final check	—	~3 min	Question numbers, units, boxed answers

2-day revision plan (29–31 October)

Day	Slot	Non-tech work (fit around your IT revision)
Thu, 29 Oct	Morning (1.5 h)	Chapter 1 + 2: formula boxes and every past-question box; redo the AP 17.01.2026 and BB AP 2023 math without looking
	Afternoon (1 h)	Chapter 3 (algebra identities, surds, sets, probability) + Chapter 4 rules: agreement, conditionals, inversion, subjunctive
	Night (1 h)	Chapter 7 GK tables once; Chapter 5: write one paragraph (150–180 words) in 12 minutes and check it against the model

Fri, 30 Oct	Morning (1 h)	**Model Test 1** (Chapter 8), timed: 25 MCQs in 15 min, written part in 37 min; mark with −0.25
	Afternoon (1 h)	**Model Test 2** timed; list every mistake in one notebook page
	Night (30 min)	Mistake page + formula boxes + last-night checklist (Chapter 8); Chapter 6 only if your exam has Bangla; sleep by 11 PM
Sat, 31 Oct	Morning	Nothing new. Read the formula box and the 10 grammar rules once on the way. Reach the centre by 8:30.

How to write written math for full marks

The 5-step layout (each 5-mark problem)

1. **Let** — define every unknown with its unit: "Let the width be x m."
2. **Equation** — write the condition from the question as an equation, numbered (i), (ii).
3. **Solve** — one operation per line; keep fractions (2/3, not 0.67) — there is no calculator.
4. **Box the answer** with its unit: "∴ Length = 16 m".
5. **Check** — one line putting the answer back into the condition.

Steps carry marks: a correct method with a slip in arithmetic still earns most of the 5 marks; a bare answer earns little.

Example of the layout AP 17.01.2026

Let the speed of the stream be s km/h. Downstream speed = 12 + s, upstream = 12 − s.
Same distance, upstream time = 3 × downstream time ⇒ downstream speed = 3 × upstream speed
12 + s = 3(12 − s) ⇒ 4s = 24 ⇒ **s = 6 km/h**
Check: downstream 18, upstream 6 → ratio 3 : 1 ✔

How to write written English for full marks

Item	What earns the marks	What loses them
Grammar (10 items)	Write the full corrected form clearly (e.g. "(A) would have succeeded"); one-line rule if space allows	Overwriting, two answers, copying the whole sentence with a new error
Sentence making	Keep the given part of speech; 10–18 words; the sentence must show the meaning (context), not just contain the word; underline the word	Changing the form (judicious → judiciously); "This is a judicious word."
Paragraph / Focus	One block for a paragraph (150–200 words); Focus: intro → current scene in Bangladesh → 3 benefits → challenges → way forward → one-line conclusion; a title on top	Fake statistics, bullet lists in a paragraph, long complex sentences with errors
Letter	Date, recipient, subject line, salutation, 3 short paragraphs, "Yours faithfully", name	Missing subject line; "Yours sincerely" with "Dear Sir"

Translation	Meaning, not word-for-word; right tense; banking terms (waive, default loan, financial inclusion)	Skipping a sentence; literal idioms

Handwriting rule

Short, correct sentences beat long, impressive ones. Leave a line between items, number them exactly as in the question, and write the paragraph title in capitals.

Chapter 1 — Arithmetic I: Percentage, Profit, Interest, Ratio, Average

Percentage · Profit, loss & discount · Simple & compound interest · Ratio · Partnership · Average · Ages

These topics give the largest share of bank-exam mathematics: in the MCQ part (15 marks) roughly half the questions come from here, and at least one or two of the four written problems (5 marks each) are usually percentage, profit or interest. Interest — especially **compound interest vs simple interest** — is the banks' favourite. No calculator is allowed, so learn the fraction equivalents and the shortcuts below.

> **How to earn full 5 marks in a written problem**
>
> 1. **Let** — define the unknown clearly ("Let the cost price be Tk x").
> 2. **Equation** — write the condition from the question as an equation.
> 3. **Solve** — show every line; work in fractions (7/20, not 0.35).
> 4. **Answer** — write a clear final line with units ("∴ Cost price = Tk 6,000").
> 5. **Check** — a one-line check proves the answer and often catches a slip.
>
> Steps carry marks even if the final number is wrong.

1.1 Percentage and successive change

x% of y = xy/100 | % change = (change ÷ original) × 100 | new value = old × (1 ± r/100)

Fraction ↔ percentage table (memorise)

Fraction	%	Fraction	%	Fraction	%
1/2	50	1/7	14 2/7	1/12	8 1/3
1/3	33 1/3	1/8	12.5	1/15	6 2/3
1/4	25	1/9	11 1/9	1/16	6.25
1/5	20	1/10	10	1/20	5
1/6	16 2/3	1/11	9 1/11	3/8	37.5

Key rules

Rules for percentage change

- **Successive change** of a% then b% ⇒ net change = **a + b + ab/100** % (use minus sign for a decrease).
- +a% followed by −a% ⇒ always a net **decrease** of $a^2/100$ %.
- If A is r% **more** than B, then B is **r/(100 + r) × 100 %** less than A.
- If A is r% **less** than B, then B is **r/(100 − r) × 100 %** more than A.
- Price rises r% ⇒ to keep expenditure the same, cut consumption by **r/(100 + r) × 100 %**. Price falls r% ⇒ consumption can rise by r/(100 − r) × 100 %.
- Length +a%, width +b% ⇒ area changes by a + b + ab/100 % (same as successive change).

Example 1 — successive change

The price of an item rises by 20% and then falls by 10%. Net change?
Net = 20 + (−10) + (20 × −10)/100 = 20 − 10 − 2 = **8% increase**. Check: 100 → 120 → 108 ✔

Example 2 — consumption

The price of sugar rises by 25%. By what percentage must a family cut consumption so that expenditure does not change?
Cut = 25/(100 + 25) × 100 = 25/125 × 100 = **20%**. Check: 1.25 × 0.80 = 1 ✔

Example 3 — "more than" vs "less than"

A's salary is 25% more than B's. By what percentage is B's salary less than A's?
= 25/125 × 100 = **20%**. (Take B = 100, A = 125; difference 25 is 20% of 125.)

Example 4 — election

In an election between two candidates, one gets 40% of the votes and loses by 2,000 votes. Total votes (all valid)?
Winner 60%, loser 40% ⇒ difference 20% = 2,000 ⇒ total = 2,000 × 100/20 = **10,000**.

Example 5 — pass marks

A student must get 33% to pass. He gets 125 marks and fails by 40 marks. Full marks?
Pass mark = 125 + 40 = 165 = 33% ⇒ full marks = 165 × 100/33 = **500**.

Example 6 — pass/fail in two subjects

20% fail in English, 25% fail in Mathematics and 10% fail in both. What percentage pass in both?
Failed in at least one = 20 + 25 − 10 = 35% ⇒ passed in both = 100 − 35 = **65%**.

Past question AP 17.01.2026

In a class, the number of boys is 35% more than the number of girls. Total students = 94. If 6 more boys are admitted, find the ratio of boys to girls.

Solution. Let girls = g. Then boys = g + 35% of g = 1.35g = 27g/20.

g + 27g/20 = 94 ⇒ 47g/20 = 94 ⇒ g = 40; boys = 94 − 40 = 54.

After admission, boys = 54 + 6 = 60 ⇒ boys : girls = 60 : 40 = **3 : 2**.

Check: 54 is 35% more than 40 (40 × 1.35 = 54) ✔

Past question BB AP 2023

A basketball team has won 15 games and lost 9. If these games represent 16⅔% of the games to be played, how many more games must the team win to average 75% for the season?

(The percentage is printed unclearly in the collection; the known version of this question uses 16⅔%.)

Solution. Games played = 15 + 9 = 24. 16⅔% = 1/6 ⇒ total games = 24 × 6 = 144.

Wins needed for 75% = 3/4 × 144 = 108 ⇒ more wins needed = 108 − 15 = **93 games**.

Traps

- **Percent vs percentage point:** interest rate rising from 8% to 10% is a rise of 2 percentage points, but a 25% rise in the rate.
- +20% then −20% is not "no change" — it is a 4% decrease.
- Always divide the change by the **original** (base) value, not the new value.

1.2 Profit, loss and discount

Profit % = (SP − CP)/CP × 100 | SP = CP × (100 ± p)/100 | CP = SP × 100/(100 ± p)

Discount is on Marked Price (MP): SP = MP × (100 − d)/100 | MP/CP = (100 + profit%)/(100 − discount%)

Rules and shortcuts

- Profit and loss % are always on **CP**; discount % is always on **MP**.
- **Successive discounts** d_1% and d_2% ⇒ single discount = $d_1 + d_2 - d_1d_2/100$ %.
- **Two items sold at the same SP**, one at x% gain and one at x% loss ⇒ always an overall **loss of $x^2/100$ %**.
- Profit % at SP_1 equals loss % at SP_2 ⇒ **$CP = (SP_1 + SP_2)/2$**.
- **Dishonest dealer** (sells at CP but uses a false weight): gain % = error/(true value − error) × 100.
- CP of x articles = SP of y articles ⇒ profit % = (x − y)/y × 100.
- Chain of sales (A → B → C): C's price = A's CP × $(1 + p_1)(1 + p_2)$.

Example 7 — from loss to gain

An article sold for Tk 1,140 gives a 5% loss. At what price should it be sold to gain 5%?
CP = 1,140 × 100/95 = Tk 1,200 ⇒ SP for 5% gain = 1,200 × 105/100 = **Tk 1,260**.
Shortcut: 1,140 × 105/95 = 1,260.

Example 8 — chain of sales

A sells to B at 20% profit; B sells to C at 25% profit. C pays Tk 1,500. A's cost price?
A's CP × 6/5 × 5/4 = 1,500 ⇒ A's CP × 3/2 = 1,500 ⇒ **Tk 1,000**.

Example 9 — same SP, equal gain and loss

Two phones are sold at Tk 990 each, one at 10% gain and the other at 10% loss. Overall?
Shortcut: loss = $10^2/100$ = **1% loss**.
Check: CP_1 = 990 × 100/110 = 900, CP_2 = 990 × 100/90 = 1,100; total CP 2,000, total SP 1,980 ⇒ loss Tk 20 = 1% ✔

Example 10 — marked price and discount

A shirt is marked Tk 2,500 and sold at a 12% discount. If the CP is Tk 2,000, find the profit %.
SP = 2,500 × 88/100 = Tk 2,200 ⇒ profit = 200 ⇒ profit % = 200/2,000 × 100 = **10%**.

Example 11 — successive discounts

Discounts of 20% and 10% on Tk 1,000. Equivalent single discount?
20 + 10 − (20 × 10)/100 = **28%**. Check: 1,000 × 0.8 × 0.9 = 720 ⇒ 28% off ✔

Note: 20% + 10% is **not** 30%; the second discount is on the already reduced price.

Example 12 — dishonest dealer

A shopkeeper claims to sell at cost price but uses a 900 g weight for 1 kg. Gain %?
Gain = 100/(1,000 − 100) × 100 = 100/900 × 100 = **11 1/9 %**.
With an 800 g weight: 200/800 × 100 = 25%.

Example 13 — buy x for Tk a, sell y for Tk b

Oranges bought at 12 for Tk 10 and sold at 10 for Tk 12. Gain %?
CP of 1 = 10/12 = 5/6; SP of 1 = 12/10 = 6/5 ⇒ SP/CP = (6/5) ÷ (5/6) = 36/25 = 1.44 ⇒ **44% gain**.

Past question BB AME 2023

The percentage profit earned by selling an article for Tk 1,920 is equal to the percentage loss incurred by selling the same article for Tk 1,280. At what price should the article be sold to make 25% profit?

Solution. Let CP = Tk C. (1,920 − C)/C × 100 = (C − 1,280)/C × 100

⇒ 1,920 − C = C − 1,280 ⇒ 2C = 3,200 ⇒ C = Tk 1,600.

SP for 25% profit = 1,600 × 125/100 = **Tk 2,000**.

Check: profit at 1,920 = 320 = 20%; loss at 1,280 = 320 = 20% ✔

Past question (MCQ) Officer IT 2026

Even after allowing a 20% discount, a trader makes a 20% profit. By what percentage is the marked price above the cost price?

Solution. Let CP = 100 ⇒ SP = 120. SP = 80% of MP ⇒ MP = 120 × 100/80 = 150.

MP is 150 − 100 = **50%** above CP. Formula check: MP/CP = 120/80 = 1.5 ✔

Traps

- Profit % on the SP is a common wrong option — always divide by CP unless the question says "on selling price".
- "Marked 40% above CP and 40% discount" is not break-even: 1.4 × 0.6 = 0.84 ⇒ 16% loss.

1.3 Simple interest

$I = P \times r \times t / 100$ | $A = P + I$ | $P = 100I/(rt)$ | $r = 100I/(Pt)$ | $t = 100I/(Pr)$

P = principal, r = rate % per annum, t = time in years, A = amount. If time is in months, t = months/12; if in days, t = days/365.

Shortcuts

- A sum becomes **k times** in t years at SI ⇒ r = 100(k − 1)/t. Doubles (k = 2) ⇒ r = 100/t.
- Amount A_1 after t_1 years and A_2 after t_2 years ⇒ yearly interest = $(A_2 - A_1)/(t_2 - t_1)$; then P = $A_1 - t_1$ × yearly interest.
- SI is the same every year (interest is always on the original P).

Example 14 — basic SI

Find the SI and amount on Tk 12,000 at 7.5% p.a. for 4 years.

I = 12,000 × 7.5 × 4/100 = **Tk 3,600**; A = 12,000 + 3,600 = **Tk 15,600**.

Example 15 — interest for days

SI on Tk 7,300 at 5% p.a. for 146 days?

I = 7,300 × 5/100 × 146/365 = 365 × 146/365 = **Tk 146**.

Example 16 — two amounts

A sum amounts to Tk 5,800 in 2 years and Tk 7,000 in 5 years at simple interest. Find the sum and the rate.

Interest for 3 years = 7,000 − 5,800 = 1,200 ⇒ per year = 400.

P = 5,800 − 2 × 400 = **Tk 5,000**; r = 400/5,000 × 100 = **8%**.

Example 17 — doubling

A sum doubles in 8 years at SI. Rate? In how many years will it become 3 times?

r = 100/8 = **12.5%**. To become 3 times, interest = 2P ⇒ t = 100 × 2/12.5 = **16 years**.

1.4 Compound interest

In compound interest, the interest of each period is added to the principal, and the next period's interest is calculated on this larger amount ("interest on interest"). Banks pay deposits (FDR, DPS) and charge loans this way.

$$A = P(1 + r/100)^n \quad | \quad CI = A - P$$

Compounding	Rate per period	Number of periods	Amount
Yearly	r	n	$P(1 + r/100)^n$
Half-yearly	r/2	2n	$P(1 + r/200)^{2n}$
Quarterly	r/4	4n	$P(1 + r/400)^{4n}$
Monthly	r/12	12n	$P(1 + r/1200)^{12n}$
Different rates r_1, r_2, r_3 in successive years	—	—	$P(1 + r_1/100)(1 + r_2/100)(1 + r_3/100)$

CI − SI shortcuts (asked very often)

- **2 years:** CI − SI = $P(r/100)^2$
- **3 years:** CI − SI = $P(r/100)^2(3 + r/100) = P\,r^2(300 + r)/100^3$
- For 1 year (yearly compounding), CI = SI.
- CI for 2 years − SI for 2 years = interest on the first year's interest.

Population growth and depreciation (same formula)

- Population after n years = $P(1 + r/100)^n$
- Population n years ago = $P \div (1 + r/100)^n$
- Value of a machine after depreciation = $V(1 - r/100)^n$; value n years ago = $V \div (1 - r/100)^n$
- Amount after n years A_1 and after n + 1 years $A_2 \Rightarrow r = (A_2 - A_1)/A_1 \times 100$.
- If a sum doubles in n years at CI, it becomes 4 times in 2n years and 8 times in 3n years.
- **Rule of 72:** years to double ≈ 72 ÷ rate (e.g. at 8% ≈ 9 years) — good for checking options.

Powers to remember: $1.1^2 = 1.21$, $1.1^3 = 1.331 \cdot 1.05^2 = 1.1025$, $1.05^3 = 1.157625 \cdot 1.04^2 = 1.0816$, $1.04^3 = 1.124864 \cdot 1.2^2 = 1.44$, $1.2^3 = 1.728 \cdot 0.9^2 = 0.81$, $0.8^2 = 0.64$, $0.8^3 = 0.512$

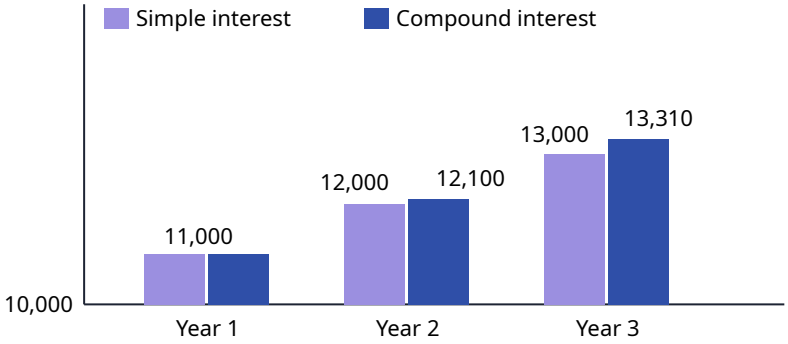


Figure 1.1: Amount on Tk 10,000 at 10% p.a. — SI grows by a fixed Tk 1,000 each year; CI grows faster (the gap is Tk 100 after 2 years and Tk 310 after 3 years).

Example 18 — yearly CI

CI on Tk 8,000 at 10% p.a. for 3 years?

$A = 8{,}000 \times 1.1^3 = 8{,}000 \times 1.331 =$ Tk 10,648 $\Rightarrow$ CI = **Tk 2,648**.

Example 19 — half-yearly

Tk 10,000 at 8% p.a. compounded half-yearly for 1 year.

Rate per half-year = 4%, periods = 2 $\Rightarrow A = 10{,}000 \times 1.04^2 = 10{,}000 \times 1.0816 =$ Tk 10,816 $\Rightarrow$ CI = **Tk 816** (yearly compounding would give only Tk 800).

Example 20 — quarterly

Tk 16,000 at 20% p.a. compounded quarterly for 9 months.

Rate per quarter = 5%, periods = 3 $\Rightarrow A = 16{,}000 \times 1.05^3 = 16{,}000 \times 1.157625 =$ Tk 18,522 $\Rightarrow$ CI = **Tk 2,522**.

Example 21 — CI − SI for 2 years (find P)

The difference between CI and SI on a sum for 2 years at 5% p.a. is Tk 25. Find the sum.

$P \times (5/100)^2 = 25 \Rightarrow P \times 1/400 = 25 \Rightarrow P =$ **Tk 10,000**.

Example 22 — CI − SI for 3 years

Find the difference between CI and SI on Tk 8,000 at 10% p.a. for 3 years.
= 8,000 × $(1/10)^2$ × (3 + 1/10) = 80 × 3.1 = **Tk 248**.
Check: CI = 2,648 (Example 18), SI = 8,000 × 10 × 3/100 = 2,400 ⇒ difference 248 ✔

Example 23 — find rate and principal from two amounts

A sum amounts to Tk 9,680 in 2 years and Tk 10,648 in 3 years at CI. Find the rate and the sum.
3rd year's interest = 10,648 − 9,680 = 968 on 9,680 ⇒ r = 968/9,680 × 100 = **10%**.
P = 9,680 ÷ 1.1^2 = 9,680 ÷ 1.21 = **Tk 8,000**.

Example 24 — different rates

Tk 5,000 is invested at 10% in the first year and 20% in the second year (compounded yearly). Amount?
A = 5,000 × 1.1 × 1.2 = **Tk 6,600**.

Example 25 — population growth

The population of a town is 50,000. It grows at 4% per year. Population after 2 years?
= 50,000 × 1.04^2 = 50,000 × 1.0816 = **54,080**.

Example 26 — population in the past

The present population is 1,32,300. It has grown at 5% per year. What was it 2 years ago?
= 1,32,300 ÷ 1.05^2 = 1,32,300 ÷ 1.1025 = **1,20,000**.

Example 27 — depreciation

A machine bought for Tk 1,25,000 depreciates at 20% per year. Its value after 3 years?
= 1,25,000 × 0.8^3 = 1,25,000 × 0.512 = **Tk 64,000**.

Example 28 — effective annual rate (bank context)

A bank offers 12% p.a. compounded quarterly. What is the effective annual rate?
$(1 + 0.03)^4 − 1$ = 1.12550881 − 1 ≈ **12.55%**. (Compounded monthly: $(1.01)^{12} − 1$ ≈ 12.68%.) The more often interest is compounded, the higher the effective rate.

Past question BB AME 2023

A father divided Tk 25,000 between his sons A and B. A invests his share at 8% p.a. compound interest and B invests at 10% p.a. simple interest. After 2 years, B's interest is Tk 1,336 more than A's. Find A's share.

Solution. Let A's share = Tk a ⇒ B's share = Tk (25,000 − a).

A's CI = $a[(1.08)^2 - 1] = a(1.1664 - 1) = 0.1664a$

B's SI = $(25{,}000 - a) \times 10 \times 2/100 = 5{,}000 - 0.2a$

Condition: $(5{,}000 - 0.2a) - 0.1664a = 1{,}336 \Rightarrow 0.3664a = 3{,}664 \Rightarrow a =$ **Tk 10,000**.

Check: A's CI = 1,664; B's share 15,000 ⇒ SI = 3,000; difference = 1,336 ✔

Traps

- Half-yearly: halve the **rate** and double the **time** — students often do only one.
- The question may ask for the **amount** or only the **interest** — read the last line again.
- For depreciation use (1 − r/100), not (1 + r/100).

1.5 Ratio and proportion

a : b = a/b | a : b = c : d ⇔ ad = bc (product of extremes = product of means)

Term	Meaning	Example
Compound ratio	(a:b) and (c:d) ⇒ ac : bd	2:3 and 4:5 ⇒ 8:15
Duplicate / triplicate ratio	$a^2 : b^2$ / $a^3 : b^3$	of 2:3 ⇒ 4:9 / 8:27
Sub-duplicate ratio	$\sqrt{a} : \sqrt{b}$	of 9:16 ⇒ 3:4
Inverse ratio	1/a : 1/b = b : a	of 3:5 ⇒ 5:3
Mean proportional of a, b	$\sqrt{(ab)}$	of 9, 16 ⇒ 12
Third proportional to a, b	b^2/a	to 4, 6 ⇒ 9
Fourth proportional to a, b, c	bc/a	to 3, 5, 12 ⇒ 20

Working rules

- **Joining ratios** A:B and B:C — make the common term (B) equal using its LCM.
- **Dividing a sum** S in the ratio a:b:c ⇒ shares = S × a/(a + b + c), etc.
- Ratio given as fractions (1/2 : 1/3 : 1/4) ⇒ multiply all by the LCM of denominators to get whole numbers.
- Most ratio problems: take the quantities as **ax** and **bx**, then form one equation in x.

Example 29 — joining ratios

A:B = 2:3 and B:C = 4:5. Find A:B:C.

LCM of 3 and 4 = 12 ⇒ A:B = 8:12, B:C = 12:15 ⇒ A:B:C = **8 : 12 : 15**.

Example 30 — fractional ratio

Divide Tk 7,800 among A, B, C in the ratio 1/2 : 1/3 : 1/4.
× 12 ⇒ 6 : 4 : 3, total 13 parts ⇒ 1 part = 7,800/13 = 600.
A = **Tk 3,600**, B = **Tk 2,400**, C = **Tk 1,800**.

Example 31 — adding to both terms

What number must be added to each term of 5 : 9 to make it 3 : 4?
(5 + x)/(9 + x) = 3/4 ⇒ 20 + 4x = 27 + 3x ⇒ x = **7**. Check: 12 : 16 = 3 : 4 ✔

Example 32 — coins

A bag has Tk 1, 50-paisa and 25-paisa coins in the ratio 5 : 6 : 8. Total value is Tk 210. Number of each coin?
Value ratio = 5×1 : 6×½ : 8×¼ = 5 : 3 : 2 (10 parts) ⇒ 1 part = Tk 21.
Values: Tk 105, Tk 63, Tk 42 ⇒ coins: **105** one-taka, 63 ÷ 0.5 = **126** fifty-paisa, 42 ÷ 0.25 = **168** twenty-five-paisa. Check: 105 : 126 : 168 = 5 : 6 : 8 ✔

Example 33 — mixture

60 litres of a mixture has milk and water in the ratio 2 : 1. How much water must be added to make the ratio 1 : 2?
Milk = 40 L, water = 20 L. Milk stays the same: 40/(20 + x) = 1/2 ⇒ 20 + x = 80 ⇒ x = **60 litres**.

MCQ speed tip

In ratio questions, the answer must fit the ratio — test the options. If A:B = 3:5, A's share must be a multiple of 3 parts; options that do not divide correctly can be eliminated at once.

1.6 Partnership

Profit share ∝ Capital × Time | A : B = $C_1t_1 : C_2t_2$

Rules

- Same time for all ⇒ profit ratio = capital ratio.
- Partner joins late or leaves early ⇒ multiply capital by the number of months it was invested.
- Capital changed in the middle ⇒ add (capital × months) for each period.
- **Working partner**: first pay the salary/commission out of the profit, then divide the rest in the capital ratio.

Example 34 — same time

A, B and C invest Tk 30,000, Tk 45,000 and Tk 60,000. Profit Tk 36,000. Shares?
Ratio 30 : 45 : 60 = 2 : 3 : 4 (9 parts), 1 part = 4,000 ⇒ **Tk 8,000, Tk 12,000, Tk 16,000**.

Example 35 — late joining

A starts a business with Tk 40,000. After 3 months B joins with Tk 60,000. Profit at the end of the year is Tk 34,000. Shares?

A : B = 40,000 × 12 : 60,000 × 9 = 4,80,000 : 5,40,000 = 8 : 9 (17 parts), 1 part = 2,000.

A = **Tk 16,000**, B = **Tk 18,000**.

Example 36 — withdrawal

A invests Tk 20,000 and B Tk 30,000. After 6 months A withdraws half his capital. Year-end profit Tk 27,000. Shares?

A = 20,000 × 6 + 10,000 × 6 = 1,80,000; B = 30,000 × 12 = 3,60,000 ⇒ 1 : 2.

A = **Tk 9,000**, B = **Tk 18,000**.

Example 37 — working partner

A and B invest in the ratio 3 : 2. A, the working partner, takes 10% of the profit as salary. Total profit Tk 50,000. A's total income?

Salary = Tk 5,000; remaining 45,000 in 3 : 2 ⇒ A 27,000, B 18,000.

A's total = 5,000 + 27,000 = **Tk 32,000**.

1.7 Average

Average = Sum ÷ Number | Sum = Average × Number

Rules and shortcuts

- **Adding a member:** new person's value = new sum − old sum = (n + 1) × new average − n × old average.
- **Removing a member:** removed value = old sum − new sum.
- **Replacing a member:** new person = old person + n × (increase in average). If the average falls, subtract.
- **Combined average** of two groups = $(n_1a_1 + n_2a_2)/(n_1 + n_2)$.
- Consecutive numbers (or any arithmetic series): average = middle term = (first + last)/2.
- First n natural numbers: average (n + 1)/2 · first n odd numbers: n · first n even numbers: n + 1.
- If every value is increased by k, the average increases by k; if every value is multiplied by k, the average is multiplied by k.

Example 38 — adding a member

The average age of 30 students is 15 years. When the teacher's age is included, the average becomes 16. Teacher's age?

= 31 × 16 − 30 × 15 = 496 − 450 = **46 years**.

Example 39 — replacement

The average weight of 8 persons increases by 2.5 kg when a new person replaces one weighing 65 kg. Weight of the new person?
= 65 + 8 × 2.5 = **85 kg**.

Example 40 — overlapping groups

The average of 11 results is 50. The average of the first 6 is 49 and of the last 6 is 52. Find the 6th result.
6th result is counted twice: 6 × 49 + 6 × 52 − 11 × 50 = 294 + 312 − 550 = **56**.

Example 41 — raising an average

A batsman's average in 10 innings is 32. How many runs must he score in the 11th innings to raise his average by 4?
Required = 11 × 36 − 10 × 32 = 396 − 320 = **76 runs**.

Example 42 — combined average

Section A has 40 students with average 60; section B has 60 students with average 70. Combined average?
= (40 × 60 + 60 × 70)/100 = (2,400 + 4,200)/100 = **66**.

Example 43 — consecutive odd numbers

The average of 5 consecutive odd numbers is 27. The largest?
Middle = 27 ⇒ 23, 25, 27, 29, 31 ⇒ largest = **31**.

1.8 Problems on ages

Method

- Let the present ages be x and y (or ax and bx if a ratio is given).
- "n years ago" ⇒ subtract n from **every** person; "after n years" ⇒ add n to every person.
- The **difference** between two people's ages never changes.
- In MCQs, test the options in both conditions — usually faster than algebra.

Example 44 — multiple

A father is 4 times as old as his son. After 5 years he will be 3 times as old. Present ages?
Son = x, father = 4x ⇒ 4x + 5 = 3(x + 5) ⇒ x = 10 ⇒ son **10**, father **40**. Check: 45 = 3 × 15 ✔

Example 45 — ratio now and later

The ratio of two people's ages is 3 : 5. After 6 years it will be 2 : 3. Present ages?
(3x + 6)/(5x + 6) = 2/3 ⇒ 9x + 18 = 10x + 12 ⇒ x = 6 ⇒ **18 and 30 years**. Check: 24 : 36 = 2 : 3 ✔

Example 46 — sum and past ratio

The sum of the ages of A and B is 50. Five years ago the ratio of their ages was 7 : 3. Present ages?
Five years ago the sum was 50 − 10 = 40 ⇒ ages then 28 and 12 ⇒ now A = **33**, B = **17**.

Example 47 — "half as old"

Ten years ago A was half as old as B. The ratio of their present ages is 3 : 4. Present ages?
3x − 10 = ½(4x − 10) ⇒ 6x − 20 = 4x − 10 ⇒ x = 5 ⇒ A = **15**, B = **20**. Check: ten years ago 5 and 10 ✔

1.9 Practice MCQ

Remember the −0.25 negative mark: answer only when you can eliminate at least two options.

1. 30% of 40% of 500 = ?

(a) 50 (b) 60
(c) 70 (d) 80

Answer: (b) — 0.3 × 0.4 × 500 = 60

2. A's income is 25% more than B's. By what percentage is B's income less than A's?

(a) 25% (b) 20%
(c) 15% (d) 22.5%

Answer: (b) — 25/125 × 100 = 20%

3. A price is increased by 10% and then decreased by 10%. The net effect is:

(a) no change (b) 1% increase
(c) 1% decrease (d) 2% decrease

Answer: (c) — 10 − 10 − 100/100 = −1%

4. If 40% of a number is 120, then 75% of the number is:

(a) 200 (b) 225
(c) 250 (d) 180

Answer: (b) — number = 300; 0.75 × 300 = 225

5. Successive discounts of 25% and 20% are equal to a single discount of:

(a) 45% (b) 40%
(c) 42% (d) 35%

Answer: (b) — 25 + 20 − 500/100 = 40%

6. The cost price of 20 articles equals the selling price of 16 articles. Profit %?

(a) 20% (b) 16%
(c) 25% (d) 30%

Answer: (c) — (20 − 16)/16 × 100 = 25%

7. Selling an item at Tk 450 causes a 10% loss. To gain 20%, it must be sold at:

(a) Tk 540 (b) Tk 560
(c) Tk 600 (d) Tk 640

Answer: (c) — CP = 450/0.9 = 500; 500 × 1.2 = 600

8. A shopkeeper sells at cost price but uses a 950 g weight for 1 kg. His gain is about:

(a) 5% (b) 5.26%
(c) 4.75% (d) 5.5%

Answer: (b) — 50/950 × 100 = 5 5/19 % ≈ 5.26%

9. Marked price Tk 800, discount 15%. Selling price?

(a) Tk 680 (b) Tk 685
(c) Tk 700 (d) Tk 720

Answer: (a) — 800 × 0.85 = 680

10. Simple interest on Tk 6,000 at 8% p.a. for 3 years 6 months?

(a) Tk 1,440 (b) Tk 1,560
(c) Tk 1,680 (d) Tk 1,800

Answer: (c) — 6,000 × 8 × 3.5/100 = 1,680

11. A sum doubles itself in 10 years at simple interest. The rate is:

(a) 5% (b) 8%
(c) 10% (d) 12.5%

Answer: (c) — r = 100/10 = 10%

12. Compound interest on Tk 10,000 at 10% p.a. for 2 years (yearly)?

(a) Tk 2,000 (b) Tk 2,100
(c) Tk 2,200 (d) Tk 2,010

Answer: (b) — 10,000 × 1.21 − 10,000 = 2,100

13. Difference between CI and SI on Tk 20,000 at 5% p.a. for 2 years?

(a) Tk 25 (b) Tk 50
(c) Tk 100 (d) Tk 200

Answer: (b) — $20,000 \times (5/100)^2 = 50$

14. CI on Tk 40,000 at 10% p.a. compounded half-yearly for 1 year?

(a) Tk 4,000 (b) Tk 4,100
(c) Tk 4,200 (d) Tk 4,410

Answer: (b) — $40,000 \times 1.05^2 = 44,100 \Rightarrow$ CI = 4,100

15. A town's population is 20,000 and increases by 10% every year. After 3 years it will be:

(a) 26,000 (b) 26,620
(c) 26,200 (d) 27,000

Answer: (b) — 20,000 × 1.331 = 26,620

16. A machine depreciates 10% every year. Its present value is Tk 81,000. Its value 2 years ago was:

(a) Tk 97,200
(b) Tk 99,000
(c) Tk 1,00,000
(d) Tk 1,01,000

Answer: (c) — $81,000 \div 0.9^2 = 81,000 \div 0.81 = 1,00,000$

17. The effective annual rate of 12% p.a. compounded quarterly is about:

(a) 12%
(b) 12.36%
(c) 12.55%
(d) 12.68%

Answer: (c) — $1.03^4 - 1 \approx 0.1255$ (12.36% is half-yearly; 12.68% is monthly)

18. A:B = 3:4 and B:C = 8:9. Then A:C = ?

(a) 1:3
(b) 3:2
(c) 2:3
(d) 1:2

Answer: (c) — A:B = 6:8, B:C = 8:9 ⇒ A:C = 6:9 = 2:3

19. The fourth proportional to 4, 9 and 12 is:

(a) 18
(b) 24
(c) 27
(d) 36

Answer: (c) — $9 \times 12/4 = 27$

20. The mean proportional between 4 and 25 is:

(a) 10
(b) 14.5
(c) 20
(d) 100

Answer: (a) — $\sqrt{(4 \times 25)} = 10$

21. A invests Tk 20,000 for 12 months and B invests Tk 30,000 for 8 months. Out of a profit of Tk 12,000, A gets:

(a) Tk 4,800
(b) Tk 6,000
(c) Tk 7,200
(d) Tk 8,000

Answer: (b) — 2,40,000 : 2,40,000 = 1:1 ⇒ Tk 6,000 each

22. The average of 4 numbers is 25. When a fifth number is added, the average becomes 27. The fifth number is:

(a) 27
(b) 31
(c) 33
(d) 35

Answer: (d) — $5 \times 27 - 4 \times 25 = 135 - 100 = 35$

23. The average of the first 10 natural numbers is:

(a) 5
(b) 5.5
(c) 6
(d) 10

Answer: (b) — $(10 + 1)/2 = 5.5$

24. The ages of A and B are in the ratio 4:5. After 5 years the ratio will be 5:6. B's present age is:

(a) 20 (b) 25

(c) 30 (d) 35

Answer: (b) — (4x + 5)/(5x + 5) = 5/6 ⇒ x = 5 ⇒ B = 25

1.10 Written practice (5 marks each)

Write each answer in the "Let → Equation → Solve → Answer → Check" format shown below.

Problem 1 — Percentage (election)

Q. In an election between two candidates, 20% of the voters did not vote and 500 of the votes cast were invalid. The winner got 55% of the valid votes and won by 750 votes. Find the total number of voters on the list.

Solution.

Let the number of valid votes = V.

Winner got 55% of V, the loser got 45% of V.

Margin = 55% − 45% = 10% of V = 750 ⇒ V = 750 × 100/10 = 7,500.

Votes cast = valid + invalid = 7,500 + 500 = 8,000.

Votes cast are 80% of the voters on the list (20% did not vote).

⇒ Total voters = 8,000 × 100/80 = 10,000.

∴ **Total number of voters = 10,000.**

Check: winner 4,125, loser 3,375 ⇒ margin 750 ✔

Problem 2 — Marked price and discount

Q. A trader marks his goods 40% above the cost price and allows a discount of 15%. If he gains Tk 1,140 on an article, find its cost price, marked price and selling price.

Solution.

Let the cost price = Tk C.

Marked price = C + 40% of C = 1.4C = 7C/5.

Selling price = 85% of MP = 0.85 × 1.4C = 1.19C.

Gain = SP − CP = 1.19C − C = 0.19C = 1,140 ⇒ C = 1,140/0.19 = 6,000.

∴ **CP = Tk 6,000; MP = 1.4 × 6,000 = Tk 8,400; SP = 0.85 × 8,400 = Tk 7,140.**

Check: 7,140 − 6,000 = 1,140 ✔ (gain 19%)

Problem 3 — Bank deposit: CI half-yearly vs SI

Q. A customer deposits Tk 50,000 in a bank at 8% p.a. interest compounded half-yearly. Find the amount and interest after 1½ years. How much more is this than simple interest at the same rate?

Solution.

Rate per half-year = 8/2 = 4%; number of half-years = 1.5 × 2 = 3.

$A = P(1 + r/100)^n = 50{,}000 \times (1.04)^3 = 50{,}000 \times 1.124864 = \text{Tk } 56{,}243.20$

CI = 56,243.20 − 50,000 = Tk 6,243.20

SI = 50,000 × 8 × 1.5/100 = Tk 6,000

Difference = 6,243.20 − 6,000 = Tk 243.20

∴ **Amount = Tk 56,243.20; CI = Tk 6,243.20; it is Tk 243.20 more than SI.**

Problem 4 — CI − SI for 3 years

Q. The difference between compound interest and simple interest on a certain sum for 3 years at 10% p.a. is Tk 930. Find the sum and the compound interest.

Solution.

Let the sum = Tk P, r = 10% = 1/10.

For 3 years: $CI - SI = P(r/100)^2(3 + r/100) = P \times (1/100) \times (31/10) = 31P/1{,}000$.

$31P/1{,}000 = 930 \Rightarrow P = 930 \times 1{,}000/31 = 30{,}000$.

$CI = 30{,}000 \times [(1.1)^3 - 1] = 30{,}000 \times 0.331 = \text{Tk } 9{,}930$.

∴ **Sum = Tk 30,000; CI = Tk 9,930.**

Check: SI = 30,000 × 10 × 3/100 = 9,000; 9,930 − 9,000 = 930 ✔

Problem 5 — Population (past value)

Q. The present population of a town is 1,75,760. It has been increasing at 4% per annum for the last 3 years. What was the population 3 years ago?

Solution.

Let the population 3 years ago = P.

$P(1 + 4/100)^3 = 1{,}75{,}760 \Rightarrow P \times (26/25)^3 = 1{,}75{,}760$

$\Rightarrow P = 1{,}75{,}760 \times 15{,}625/17{,}576 = 10 \times 15{,}625 = 1{,}56{,}250$.

∴ **Population 3 years ago = 1,56,250.**

Note: $26^3 = 17{,}576$ and $25^3 = 15{,}625$, so the fraction method avoids long decimals.

Check: 1,56,250 × 1.124864 = 1,75,760 ✔

Problem 6 — Partnership

Q. A starts a business with Tk 50,000. After 3 months B joins with Tk 60,000, and after 6 months C joins with Tk 80,000. At the end of the year the profit is Tk 54,000. Find each partner's share.

Solution.

Profit is divided in the ratio of capital × time (in months):

A = 50,000 × 12 = 6,00,000; B = 60,000 × 9 = 5,40,000; C = 80,000 × 6 = 4,80,000.

A : B : C = 600 : 540 : 480 = 10 : 9 : 8 (total 27 parts).

1 part = 54,000/27 = 2,000.

∴ **A = Tk 20,000; B = Tk 18,000; C = Tk 16,000.**

Check: 20,000 + 18,000 + 16,000 = 54,000 ✔

Problem 7 — Average (two groups)

Q. The average monthly salary of all employees of a bank branch is Tk 32,000. The average salary of 8 officers is Tk 50,000 and that of the other employees is Tk 26,000. Find the total number of employees.

Solution.

Let the number of other employees = n.

Total salary: 8 × 50,000 + 26,000n = 32,000(8 + n)

⇒ 4,00,000 + 26,000n = 2,56,000 + 32,000n

⇒ 6,000n = 1,44,000 ⇒ n = 24.

∴ **Total employees = 8 + 24 = 32.**

Check: (4,00,000 + 6,24,000)/32 = 10,24,000/32 = 32,000 ✔

Problem 8 — Ages

Q. The present ages of a father and his son are in the ratio 5 : 2. After 8 years the ratio will be 2 : 1. Find their present ages. How many years ago was the father 4 times as old as the son?

Solution.

Let the present ages be 5x and 2x years.

(5x + 8)/(2x + 8) = 2/1 ⇒ 5x + 8 = 4x + 16 ⇒ x = 8.

Father = 40 years, son = 16 years.

Let t years ago the father was 4 times as old: 40 − t = 4(16 − t) ⇒ 40 − t = 64 − 4t ⇒ 3t = 24 ⇒ t = 8.

∴ **Father 40, son 16; the father was 4 times as old 8 years ago (32 and 8).**

Check: after 8 years 48 : 24 = 2 : 1 ✔

Problem 9 — Ratio (income and expenditure)

Q. The incomes of A and B are in the ratio 5 : 4 and their expenditures are in the ratio 3 : 2. If each saves Tk 1,600 per month, find their incomes.

Solution.

Let incomes = 5x and 4x, expenditures = 3y and 2y.

Saving = income − expenditure: 5x − 3y = 1,600 ...(i) and 4x − 2y = 1,600 ...(ii)

From (ii): y = 2x − 800. Put in (i): 5x − 3(2x − 800) = 1,600 ⇒ −x + 2,400 = 1,600 ⇒ x = 800.

∴ **A's income = Tk 4,000; B's income = Tk 3,200.**

Check: y = 800 ⇒ expenditures 2,400 and 1,600; savings 1,600 each ✔

Last-minute checklist for this chapter

- Successive change a + b + ab/100 — also gives successive discounts (with minus signs) and area change.
- Profit/loss on CP, discount on MP; MP/CP = (100 + p)/(100 − d).
- CI − SI: 2 years $P(r/100)^2$; 3 years $P(r/100)^2(3 + r/100)$.
- Half-yearly: r/2 and 2n; quarterly: r/4 and 4n. Depreciation: $(1 - r/100)^n$.
- Partnership: capital × months. Average: work with sums, not averages.

Chapter 2 — Arithmetic II: Work, Speed, Mixtures, Numbers, Series

Time & work · Pipes · Speed & trains · Boats · Mixtures · Number system · Surds · Series & reasoning

These topics give the fastest marks in both the MCQ (15 marks) and the written maths (20 marks). Almost every bank IT paper has at least one question on work, trains, boats or HCF/LCM. Learn the one-line formula, the LCM/unit trick and the trap for each topic, then solve the past questions in the blue boxes.

2.1 Time and Work

Core idea

If a person finishes a job in **n** days, he does **1/n** of the job per day. Rates add when people work together; time = work ÷ rate.

Together (A in a days, B in b days) = ab/(a + b) days · $M_1D_1H_1/W_1 = M_2D_2H_2/W_2$

2.1.1 The LCM (unit) method — no fractions

1. Take total work = LCM of all the given days (call them "units").
2. Daily work of each person = total units ÷ his days.
3. Add/subtract the daily units, then divide.

Example 1 — Two people together

A can do a job in 12 days, B in 18 days. How long together?
Total work = LCM(12, 18) = 36 units. A = 36/12 = 3 units/day, B = 36/18 = 2 units/day.
Together = 5 units/day ⇒ time = 36/5 = **7.2 days** (= 7⅕ days). Check: ab/(a+b) = 216/30 = 7.2 ✔

Example 2 — One person leaves

A (12 days) and B (18 days) work together for 4 days, then A leaves. In how many more days will B finish?
Using 36 units: in 4 days they do 4 × 5 = 20 units. Remaining = 16 units. B does 2 units/day ⇒ **8 days**.

Example 3 — Pairs given (A+B, B+C, C+A)

A and B can do a job in 10 days, B and C in 15 days, C and A in 12 days. How long will all three take together? How long A alone?
Total = LCM(10, 15, 12) = 60 units. A+B = 6, B+C = 4, C+A = 5 units/day.
Adding: 2(A + B + C) = 15 ⇒ A + B + C = 7.5 units/day ⇒ all three = 60/7.5 = **8 days**.
A = (A+B+C) − (B+C) = 7.5 − 4 = 3.5 units/day ⇒ A alone = 60/3.5 = **120/7 = 17 1/7 days**.

2.1.2 Efficiency

- Efficiency ∝ 1/time. If A is **twice** as efficient as B, A takes **half** the time.
- "A is 50% more efficient than B" ⇒ efficiency ratio A : B = 3 : 2 ⇒ time ratio = 2 : 3.
- Man-days rule: work ∝ men × days × hours. For the same work, $M_1D_1H_1 = M_2D_2H_2$.

Example 4 — Efficiency

A is twice as efficient as B. Together they finish a job in 12 days. How long does each take alone?
Let B = 1 unit/day, A = 2 units/day ⇒ together 3 units/day ⇒ total work = 3 × 12 = 36 units.
A alone = 36/2 = **18 days**; B alone = 36/1 = **36 days**.

Example 5 — Men, days, hours

15 men working 8 hours a day finish a job in 20 days. How many days will 20 men take working 6 hours a day?
15 × 20 × 8 = 20 × D × 6 ⇒ D = 2400/120 = **20 days**.

2.1.3 Splitting wages

Rule

Wages are shared in the ratio of **work done**, not of days. If all work for the same number of days, work done ∝ efficiency (daily rate).

Example 6 — Wages with a helper

A can do a job in 6 days, B in 8 days. With the help of C they finish it in 3 days and get Tk 3,200. Find each share.
In 3 days: A does 3/6 = 1/2, B does 3/8. C does 1 − 1/2 − 3/8 = 1/8.
Ratio A : B : C = 1/2 : 3/8 : 1/8 = 4 : 3 : 1 ⇒ A = **Tk 1,600**, B = **Tk 1,200**, C = **Tk 400**.

Past question

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One person can do a job in 6 days, another in 10 days. How long will they take together?
1/6 + 1/10 = 5/30 + 3/30 = 8/30 per day ⇒ time = 30/8 = **3.75 days** (3¾ days). Shortcut: 6 × 10/(6 + 10) = 60/16 = 3.75.

Traps

(1) Never add days (6 + 10 = 16 is wrong) — add **rates**. (2) "A leaves 3 days before completion" — A works (T − 3) days, B works T days. (3) Share wages by work, not by days alone.

2.2 Pipes and Cisterns

Exactly like time and work: an inlet pipe does **positive** work, an outlet (or leak) does **negative** work.

Inlet fills in a h, outlet empties in b h ⇒ net fill time = ab/(b − a) h (b > a)

Example 1 — Three pipes

Pipes A and B fill a tank in 10 h and 15 h; pipe C empties it in 12 h. All three are opened. Time to fill?
LCM = 60 units: A = +6, B = +4, C = −5 ⇒ net = +5 units/h ⇒ **12 hours**.

Example 2 — Leak

A pipe fills a tank in 6 h, but due to a leak it takes 8 h. How long will the leak take to empty a full tank?
Leak rate = 1/6 − 1/8 = 1/24 ⇒ leak empties it in **24 hours**.

Example 3 — When to close a pipe

A fills a tank in 20 min, B in 30 min. Both are opened; after how many minutes must B be closed so the tank fills in exactly 15 min?
A works the full 15 min: 15/20 = 3/4 of the tank. B must fill 1/4 ⇒ B works 30 × 1/4 = **7.5 min**.

Shortcut

For "closed after t minutes" problems, the pipe that runs the whole time fixes most of the tank — calculate it first, the rest is the other pipe's share.

2.3 Speed, Distance and Time

Distance = Speed × Time · 1 km/h = 5/18 m/s · 1 m/s = 18/5 km/h

Situation	Formula	Memory hook
Same distance at u and v	Average speed = 2uv/(u + v)	Harmonic mean, never (u+v)/2
Three equal distances at x, y, z	3/(1/x + 1/y + 1/z)	Extend the same idea
Equal **times** at u and v	(u + v)/2	Only here the simple average works
Opposite directions	Relative speed = $v_1 + v_2$	Approaching or separating: add
Same direction	Relative speed = $v_1 - v_2$	Chasing: subtract
Speed ratio a : b (same distance)	Time ratio = b : a	Inverse

Example 1 — Average speed

A car goes from Dhaka to Cumilla at 60 km/h and returns at 40 km/h. Average speed = 2 × 60 × 40/(60 + 40) = 4800/100 = **48 km/h** (not 50).

Example 2 — Three equal parts

A man covers three equal distances at 10, 20 and 60 km/h. Average speed = 3/(1/10 + 1/20 + 1/60) = 3/(10/60) = **18 km/h**.

Example 3 — Late and early

Walking at 5 km/h a man is 7 min late; at 6 km/h he is 5 min early. Find the distance.
Time difference = 7 + 5 = 12 min = 1/5 h. d/5 − d/6 = 1/5 ⇒ d/30 = 1/5 ⇒ d = **6 km**.

Example 4 — Chase

A thief runs at 8 km/h. A policeman starts 15 min later at 10 km/h. When and where does he catch the thief?
Head start = 8 × 1/4 = 2 km. Relative speed = 10 − 8 = 2 km/h ⇒ time = 2/2 = **1 hour**; the policeman runs 10 × 1 = **10 km**.

Past question

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Two trucks are 300 km apart and move towards each other at 70 km/h and 50 km/h. When do they meet?
Opposite directions ⇒ relative speed = 70 + 50 = 120 km/h ⇒ time = 300/120 = **2.5 hours**.

Past question

Officer IT 2026

A vehicle at 15 km/h crosses a bridge in 15 minutes. Length of the bridge?
Distance = 15 × 15/60 = 15 × ¼ = **3.75 km** (ignoring the length of the vehicle).

Traps

Convert units first (minutes → hours, km/h → m/s). In "late/early" questions, the time gap is late + early (7 + 5), not the difference.

2.4 Problems on Trains

One rule covers everything

Time = (total length that must be covered) ÷ (relative speed). A pole, man or signal post has length ≈ 0; a platform, bridge or tunnel adds its own length.

Train crosses…	Distance	Speed used
a pole / standing man	L (train)	v
a platform / bridge / tunnel of length P	L + P	v
a man walking at u (same direction)	L	v − u
another train (opposite directions)	$L_1 + L_2$	$v_1 + v_2$
another train (same direction)	$L_1 + L_2$	$v_1 - v_2$

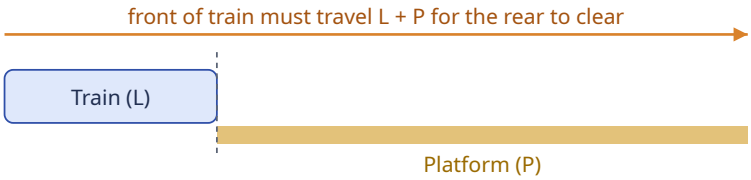


Figure 2.1: Crossing a platform — the train covers its own length plus the platform length.

Example 1 — Pole

A 150 m train crosses a pole in 10 s. Speed = 150/10 = 15 m/s = 15 × 18/5 = **54 km/h**.

Example 2 — Pole and platform (find L and v)

A train crosses a pole in 15 s and a 100 m platform in 25 s. Same speed ⇒ L/15 = (L + 100)/25 ⇒ 25L = 15L + 1500 ⇒ L = **150 m**; v = 150/15 = 10 m/s = **36 km/h**.

Shortcut: the extra 100 m took 10 s ⇒ v = 10 m/s directly.

Example 3 — Two trains

Trains of 120 m (36 km/h) and 80 m (54 km/h). Total length 200 m.

Opposite: 36 + 54 = 90 km/h = 25 m/s ⇒ 200/25 = **8 s**. Same direction: 54 − 36 = 18 km/h = 5 m/s ⇒ 200/5 = **40 s**.

Example 4 — Passing a walking man

A 150 m train passes a man walking at 6 km/h in the same direction in 9 s. Train speed?

Relative speed = 150/9 m/s = (150/9) × 18/5 = 60 km/h ⇒ train = 60 + 6 = **66 km/h**.

Past question

Officer IT 2026

A 220 m long train runs at 45 km/h. How long will it take to cross a 260 m tunnel?

45 km/h = 45 × 5/18 = 12.5 m/s. Distance = 220 + 260 = 480 m ⇒ time = 480/12.5 = **38.4 s**.

Traps

Forgetting to add the platform length; mixing m with km/h (always convert to m/s); adding speeds when trains move in the same direction.

2.5 Boats and Streams

Downstream D = b + s · Upstream U = b − s · b = (D + U)/2 · s = (D − U)/2

b = speed of the boat (or man) in still water, s = speed of the stream (current).

Past question

AP 17.01.2026

A man can row 12 km/h in still water. It takes him thrice as long to row up as to row down the river. Find the rate of the stream.

Let the stream = s km/h. Same distance, upstream time = 3 × downstream time ⇒ downstream speed = 3 × upstream speed.

12 + s = 3(12 − s) ⇒ 12 + s = 36 − 3s ⇒ 4s = 24 ⇒ **s = 6 km/h**.

Check: downstream 18, upstream 6 — ratio 3 : 1 ✔

Shortcut for "k times as long upstream"

s = b(k − 1)/(k + 1). Here 12 × 2/4 = 6 km/h. Use it to check MCQs in 5 seconds.

Example 1 — Round trip

Boat 15 km/h in still water, stream 3 km/h. Time to go 36 km and come back?

D = 18, U = 12 ⇒ 36/18 + 36/12 = 2 + 3 = **5 hours**.

Example 2 — Find b and s

A boat goes 30 km downstream in 2 h and 18 km upstream in 3 h. D = 15, U = 6 ⇒ b = (15 + 6)/2 = **10.5 km/h**, s = (15 − 6)/2 = **4.5 km/h**.

Example 3 — Distance from total time

A man rows at 6 km/h in still water; the stream flows at 2 km/h. He takes 3 h to row to a place and back. Distance?

d/8 + d/4 = 3 ⇒ 3d/8 = 3 ⇒ d = **8 km**.

2.6 Mixtures and Alligation

Cheaper qty : Dearer qty = (Dearer − Mean) : (Mean − Cheaper)

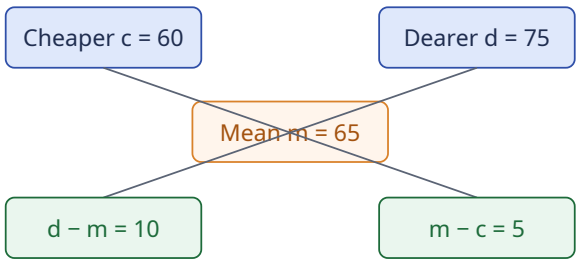


Figure 2.2: Alligation cross — subtract diagonally; the result under each price is the quantity of that kind (10 : 5 = 2 : 1).

Example 1 — Two kinds of rice

In what ratio must rice at Tk 60/kg be mixed with rice at Tk 75/kg so the mixture is worth Tk 65/kg?

(75 − 65) : (65 − 60) = 10 : 5 = **2 : 1** (cheaper : dearer).

Example 2 — Alligation with profit

Tea at Tk 300/kg and Tk 400/kg is mixed and sold at Tk 418/kg for a 10% profit. Find the mixing ratio.

Cost price of mixture = 418/1.1 = Tk 380 (this is the mean). (400 − 380) : (380 − 300) = 20 : 80 = **1 : 4**.

Example 3 — Adding water

40 L of milk and water are in the ratio 3 : 1. How much water must be added to make the ratio 3 : 2?

Milk = 30 L, water = 10 L. Milk stays 30 ⇒ 30/(10 + x) = 3/2 ⇒ 10 + x = 20 ⇒ **x = 10 L**.

Repeated replacement: pure left = $V \times (1 - x/V)^n$ (x litres taken out and replaced n times)

Example 4 — Repeated replacement

A can holds 40 L of milk. 4 L is taken out and replaced with water; this is done 3 times. Milk left?

$40 \times (1 - 4/40)^3 = 40 \times (0.9)^3 = 40 \times 0.729 =$ **29.16 L**.

Traps

In alligation the mean must lie between the two prices. With profit given, first convert the selling price to the cost price of the mixture. When adding water, the **milk** quantity is the one that stays fixed.

2.7 Number System

2.7.1 Divisibility rules

By	Rule	By	Rule
2	last digit even	8	last 3 digits divisible by 8
3	digit sum divisible by 3	9	digit sum divisible by 9
4	last 2 digits divisible by 4	10	last digit 0
5	last digit 0 or 5	11	(sum of odd-place digits) − (sum of even-place digits) = 0 or multiple of 11
6	divisible by 2 and 3	12	divisible by 3 and 4
7	double the last digit, subtract from the rest; repeat	15 / 18	3 and 5 / 2 and 9 (co-prime factors)

Example — Missing digit and 11-test

(a) Which digit * makes 47*6 divisible by 9? 4 + 7 + 6 = 17 ⇒ 17 + * = 18 ⇒ *** = 1** (4716 = 9 × 524).

(b) Is 73964 divisible by 11? (7 + 9 + 4) − (3 + 6) = 20 − 9 = 11 ⇒ **yes** (73964 = 11 × 6724).

2.7.2 HCF and LCM

HCF × LCM = product of the two numbers · HCF of fractions = HCF(numerators)/LCM(denominators) · LCM of fractions = LCM(numerators)/HCF(denominators)

- HCF by prime factors: take the **lowest** power of common primes. LCM: take the **highest** power of all primes.
- The HCF always divides the LCM. Co-prime numbers have HCF 1 and LCM = product.

Past question

Officer IT 2026

The HCF of two numbers is 12, the LCM is 288, and one number is 96. Find the other.
Other = HCF × LCM ÷ given number = 12 × 288/96 = 3456/96 = **36**. Check: HCF(96, 36) = 12, LCM = 288 ✔

Word-problem type	Use	Worked example
Greatest number that divides a, b, c leaving the **same** remainder	HCF of the differences	43, 91, 183 ⇒ HCF(48, 92, 140) = **4**
Greatest number that divides a, b leaving remainders r_1, r_2	HCF(a − r_1, b − r_2)	1657, 2037 with 6, 5 ⇒ HCF(1651, 2032) = **127**
Least number that leaves the same remainder r on division by a, b, c	LCM + r	12, 15, 20 with r = 4 ⇒ 60 + 4 = **64**
Least number leaving remainders 3, 4, 5 on division by 5, 6, 7 (divisor − remainder = 2 constant)	LCM − (common difference)	LCM 210 − 2 = **208**
Bells / lights together again	LCM of intervals	6, 8, 12 min from 10:00 ⇒ LCM 24 ⇒ **10:24**
Largest square tile for a floor	HCF of the sides	6.24 m × 4.32 m ⇒ HCF(624, 432) = 48 cm; tiles = 13 × 9 = **117**

Trap

"Greatest … divides" ⇒ HCF; "least … divisible by" ⇒ LCM. In the tile question, convert both sides to the same unit (cm) before taking the HCF.

2.7.3 Remainders

- (a × b) mod n = [(a mod n) × (b mod n)] mod n — reduce first, then multiply.
- If a ≡ −1 (mod n), then a^{even} leaves remainder 1, a^{odd} leaves n − 1.
- If N leaves remainder r on division by d, and k divides d, then N mod k = r mod k.

Examples

(a) $2^{31} \div 5$: powers of 2 mod 5 cycle 2, 4, 3, 1 (length 4). $31 = 4 \times 7 + 3 \Rightarrow$ same as $2^3 = 8 \Rightarrow$ remainder **3**.

(b) $17^{200} \div 18$: $17 \equiv -1 \pmod{18}$, even power $\Rightarrow$ remainder **1**.

(c) A number leaves remainder 19 when divided by 36. Remainder on division by 12? 12 divides 36 $\Rightarrow$ 19 mod 12 = **7**.

2.7.4 Unit digit

Cyclicity 4

Unit digits of powers repeat every 4: $2 \rightarrow 2, 4, 8, 6 \cdot 3 \rightarrow 3, 9, 7, 1 \cdot 7 \rightarrow 7, 9, 3, 1 \cdot 8 \rightarrow 8, 4, 2, 6$. Digits 0, 1, 5, 6 never change; 4 and 9 repeat every 2 (4, 6 / 9, 1).

Method: divide the power by 4, use the remainder (remainder 0 $\Rightarrow$ use power 4).

Examples

(a) Unit digit of 7^{95}: 95 mod 4 = 3 $\Rightarrow 7^3 = 343 \Rightarrow$ **3**.

(b) Unit digit of $2^{50} \times 3^{33}$: 50 mod 4 = 2 $\Rightarrow$ 4; 33 mod 4 = 1 $\Rightarrow$ 3; $4 \times 3 = 12 \Rightarrow$ **2**.

(c) Unit digit of 1! + 2! + ... + 100!: from 5! onward every term ends in 0 $\Rightarrow 1 + 2 + 6 + 24 = 33 \Rightarrow$ **3**.

2.7.5 Number of factors, trailing zeros and the prime test

$$N = p^a \cdot q^b \cdot r^c \Rightarrow \text{number of factors} = (a + 1)(b + 1)(c + 1)$$

Example — 360

$360 = 2^3 \times 3^2 \times 5^1 \Rightarrow$ factors $= 4 \times 3 \times 2 =$ **24**. (Sum of factors $= (1+2+4+8)(1+3+9)(1+5) = 15 \times 13 \times 6 = 1170$.)

Only perfect squares have an **odd** number of factors.

Trailing zeros of n!

Count the 5s: $\lfloor n/5 \rfloor + \lfloor n/25 \rfloor + \lfloor n/125 \rfloor + \ldots$ 100! $\Rightarrow 20 + 4 =$ **24** zeros; 50! $\Rightarrow 10 + 2 =$ **12** zeros.

Prime test

To test n, divide only by primes $\leq \sqrt{n}$. If none divides, n is prime.

391: $\sqrt{391} \approx 19.8$; $391 = 17 \times 23 \Rightarrow$ **not prime**. 241: $\sqrt{241} \approx 15.5$; not divisible by 2, 3, 5, 7, 11, 13 $\Rightarrow$ **prime**.

Facts: there are 25 primes from 1 to 100; 2 is the only even prime; 1 is neither prime nor composite.

Common "looks prime" traps

$51 = 3 \times 17$, $57 = 3 \times 19$, $87 = 3 \times 29$, $91 = 7 \times 13$, $119 = 7 \times 17$, $133 = 7 \times 19$, $143 = 11 \times 13$, $161 = 7 \times 23$, $187 = 11 \times 17$, $221 = 13 \times 17$.

Useful sums

$1 + 2 + \ldots + n = n(n+1)/2$ · $1^2 + \ldots + n^2 = n(n+1)(2n+1)/6$ · $1^3 + \ldots + n^3 = [n(n+1)/2]^2$ · first n odd numbers = n^2.

2.8 Simplification (BODMAS) and Surds

2.8.1 BODMAS

Order: **B**rackets ( ), { }, [ ] → **O**f → **D**ivision and **M**ultiplication (left to right) → **A**ddition and **S**ubtraction (left to right).

Examples

(a) $48 \div 12 \times 4 + 6 - 2 = 4 \times 4 + 6 - 2 = 16 + 6 - 2 =$ **20** (÷ and × left to right).

(b) $8 \div 2$ of $4 = 8 \div 8 =$ **1** ("of" is done before ÷).

(c) $0.5 \times 0.5 + 0.5 \div 5 = 0.25 + 0.1 =$ **0.35**.

(d) $(1.25^2 - 0.75^2)/(1.25 - 0.75) = 1.25 + 0.75 =$ **2** (use $a^2 - b^2 = (a+b)(a-b)$).

Recurring decimals

$0.\overline{3} = 3/9 = 1/3$ · $0.\overline{27} = 27/99 = 3/11$ · $0.1\overline{6} = (16-1)/90 = 1/6$. Rule: (whole number formed − non-repeating part) ÷ (one 9 per repeating digit, one 0 per non-repeating digit).

2.8.2 Surds

$$\sqrt{a}\cdot\sqrt{b} = \sqrt{(ab)} \;\cdot\; (\sqrt{a}+\sqrt{b})(\sqrt{a}-\sqrt{b}) = a - b \;\cdot\; \sqrt{(a+b+2\sqrt{ab})} = \sqrt{a}+\sqrt{b}$$

- **Rationalise**: multiply top and bottom by the conjugate. $1/(\sqrt{3}+\sqrt{2}) = (\sqrt{3}-\sqrt{2})/(3-2) = \sqrt{3}-\sqrt{2}$.
- **Like surds**: $\sqrt{12} + \sqrt{27} - \sqrt{48} = 2\sqrt{3} + 3\sqrt{3} - 4\sqrt{3} = \sqrt{3}$.
- **Square root of a surd**: $\sqrt{(7 + 4\sqrt{3})} = \sqrt{(4 + 3 + 2\sqrt{12})} =$ **$2 + \sqrt{3}$**.
- **Compare** $\sqrt{3}+\sqrt{7}$ and $\sqrt{5}+\sqrt{5}$: square both ⇒ $10 + 2\sqrt{21}$ vs $10 + 2\sqrt{25}$ ⇒ **$\sqrt{5} + \sqrt{5}$ is greater**.
- If $x = 3 + 2\sqrt{2}$, then $1/x = 3 - 2\sqrt{2}$ ⇒ $x + 1/x =$ **6**.

Past question

BB AME 2023

Find the value of $4(\sqrt{6}+\sqrt{2})/(\sqrt{6}-\sqrt{2}) - (2+\sqrt{3})/(2-\sqrt{3})$.

$(\sqrt{6}+\sqrt{2})/(\sqrt{6}-\sqrt{2}) = (\sqrt{6}+\sqrt{2})^2/(6-2) = (8+2\sqrt{12})/4 = (8+4\sqrt{3})/4 = 2+\sqrt{3}$ ⇒ first term $= 4(2+\sqrt{3}) = 8 + 4\sqrt{3}$.

$(2+\sqrt{3})/(2-\sqrt{3}) = (2+\sqrt{3})^2/(4-3) = 7 + 4\sqrt{3}$.

Value $= (8 + 4\sqrt{3}) - (7 + 4\sqrt{3}) =$ **1**.

2.9 Number Series and Simple Reasoning Puzzles

2.9.1 How to crack a series in 30 seconds

1. Take differences. Constant ⇒ arithmetic; differences themselves in a pattern ⇒ second-level series.

2. Check ratios (×2, ×3) and ×k ± c patterns.
3. Look for squares / cubes ± 1, n(n + 1), primes, Fibonacci.
4. Large jumps up and down ⇒ two alternating series.

Series	Rule	Next
2, 6, 12, 20, 30, ?	n(n + 1)	42
3, 7, 15, 31, 63, ?	×2 + 1	127
5, 11, 23, 47, ?	×2 + 1	95
2, 5, 10, 17, 26, ?	$n^2 + 1$	37
1, 8, 27, 64, ?	cubes	125
1, 4, 2, 8, 3, 12, ?	alternating: 1, 2, 3, 4 and 4, 8, 12	4
1, 1, 2, 3, 5, 8, ?	Fibonacci (sum of previous two)	13
A, C, F, J, O, ?	+2, +3, +4, +5, +6 (letter positions 1, 3, 6, 10, 15)	U (21)
Wrong term: 3, 9, 27, 81, 242, 729	×3	242 should be 243

2.9.2 Quick reasoning rules

Type	Rule / trick	Example
Coding	Find the shift for each letter	CAT → DBU (+1) ⇒ DOG → **EPH**
Direction	Draw it; use Pythagoras for distance	4 km north, turn right, 3 km ⇒ **5 km** from start (north-east)
Ranking	Total = top rank + bottom rank − 1	7th from top, 18th from bottom ⇒ **24**
Blood relation	Draw a family tree	"His mother is the only daughter of my mother" ⇒ the speaker is his **mother**
Clock angle	θ = |30H − 5.5M|	3:40 ⇒ |90 − 220| = **130°**
Calendar (odd days)	Days ahead = n mod 7	100 days after Monday: 100 mod 7 = 2 ⇒ **Wednesday**

> **Exam tip**
> With −0.25 negative marking, series and reasoning are "sure" marks if you test the options: put each option into the pattern and keep the one that fits every term.

2.10 Practice MCQ

Target: 24 questions in 15 minutes. Answers are verified; cover them while practising.

1. A can finish a job in 20 days and B in 30 days. Working together they need:

(a) 10 days
(b) 12 days
(c) 15 days
(d) 25 days

Answer: (b) — 20 × 30/(20 + 30) = 600/50 = 12.

2. A is twice as efficient as B. Together they finish a job in 14 days. A alone needs:

(a) 18 days
(b) 28 days
(c) 21 days
(d) 42 days

Answer: (c) — Rates 2 + 1 = 3; work = 42 units; A = 42/2 = 21.

3. 12 men can build a wall in 18 days. How many days will 8 men take?

(a) 12
(b) 24
(c) 30
(d) 27

Answer: (d) — 12 × 18 = 8 × D ⇒ D = 27.

4. A pipe fills a tank in 4 h; a leak empties the full tank in 12 h. With the leak, the tank fills in:

(a) 6 h
(b) 5 h
(c) 8 h
(d) 3 h

Answer: (a) — 1/4 − 1/12 = 2/12 = 1/6.

5. 72 km/h is equal to:

(a) 18 m/s
(b) 20 m/s
(c) 25 m/s
(d) 30 m/s

Answer: (b) — 72 × 5/18 = 20.

6. A man goes at 40 km/h and returns over the same road at 60 km/h. Average speed?

(a) 50 km/h
(b) 45 km/h
(c) 48 km/h
(d) 52 km/h

Answer: (c) — 2 × 40 × 60/100 = 48.

7. A 300 m train running at 72 km/h crosses a 200 m platform in:

(a) 15 s
(b) 20 s
(c) 30 s
(d) 25 s

Answer: (d) — 72 km/h = 20 m/s; (300 + 200)/20 = 25 s.

8. A 240 m train passes a signal post in 16 s. Its speed is:

(a) 54 km/h
(b) 48 km/h
(c) 60 km/h
(d) 15 km/h

Answer: (a) — 240/16 = 15 m/s × 18/5 = 54 km/h.

9. Two trains, each 150 m long, run in the same direction at 60 km/h and 42 km/h. Time for the faster to pass the slower?

(a) 30 s
(b) 60 s
(c) 45 s
(d) 10.8 s

Answer: (b) — Relative 18 km/h = 5 m/s; 300/5 = 60 s.

10. Downstream speed 16 km/h, upstream speed 10 km/h. Speed of the stream?

(a) 6 km/h
(b) 13 km/h
(c) 3 km/h
(d) 4 km/h

Answer: (c) — (16 − 10)/2 = 3.

11. Sugar at Tk 20/kg and Tk 32/kg is mixed to get a mixture worth Tk 24/kg. Ratio (cheaper : dearer)?

(a) 2 : 1
(b) 1 : 2
(c) 3 : 2
(d) 1 : 1

Answer: (a) — (32 − 24) : (24 − 20) = 8 : 4 = 2 : 1.

12. HCF of 2/3, 8/9 and 16/81 is:

(a) 2/3
(b) 16/81
(c) 2/81
(d) 8/3

Answer: (c) — HCF(2, 8, 16)/LCM(3, 9, 81) = 2/81.

13. LCM of 18, 24 and 36 is:

(a) 36
(b) 144
(c) 108
(d) 72

Answer: (d) — $2^3 \times 3^2 = 72$.

14. The unit digit of 3^{65} is:

(a) 3
(b) 9
(c) 7
(d) 1

Answer: (a) — 65 mod 4 = 1 ⇒ like 3^1 ⇒ 3.

15. Number of factors of 180:

(a) 12
(b) 18
(c) 16
(d) 20

Answer: (b) — $180 = 2^2 \times 3^2 \times 5$ ⇒ 3 × 3 × 2 = 18.

16. Remainder when 2^{100} is divided by 3:

(a) 0
(b) 2
(c) 1
(d) 3

Answer: (c) — $2 \equiv -1 \pmod 3$; even power ⇒ 1.

17. Which of these is a prime number?

(a) 91 (b) 119
(c) 133 (d) 127

Answer: (d) — 91 = 7×13, 119 = 7×17, 133 = 7×19; 127 has no prime factor ≤ 11.

18. Which number is divisible by 11?

(a) 45678 (b) 61721
(c) 52431 (d) 73624

Answer: (b) — (6 + 7 + 1) − (1 + 2) = 11.

19. Next term: 4, 9, 19, 39, 79, ?

(a) 158 (b) 159
(c) 160 (d) 119

Answer: (b) — ×2 + 1 ⇒ 79 × 2 + 1 = 159.

20. The angle between the hands of a clock at 4:20 is:

(a) 0° (b) 5°
(c) 10° (d) 20°

Answer: (c) — |30 × 4 − 5.5 × 20| = |120 − 110| = 10°.

21. $0.\overline{36}$ (0.363636...) as a fraction:

(a) 4/11 (b) 9/25
(c) 36/100 (d) 3/11

Answer: (a) — 36/99 = 4/11.

22. $\sqrt{(8 + 2\sqrt{15})}$ = ?

(a) $2 + \sqrt{2}$ (b) $\sqrt{6} + \sqrt{2}$
(c) $3 + \sqrt{5}$ (d) $\sqrt{5} + \sqrt{3}$

Answer: (d) — 8 = 5 + 3 and $2\sqrt{15} = 2\sqrt{(5 \cdot 3)} \Rightarrow \sqrt{5} + \sqrt{3}$.

23. Number of zeros at the end of 50!:

(a) 10 (b) 12
(c) 5 (d) 11

Answer: (b) — 50/5 + 50/25 = 10 + 2 = 12.

24. The greatest number that divides 285 and 1249 leaving remainders 9 and 7 respectively:

(a) 69 (b) 92
(c) 138 (d) 276

Answer: (c) — HCF(285 − 9, 1249 − 7) = HCF(276, 1242) = 138.

2.11 Written Practice (5 marks each)

How to write for full marks

Write "Let …", state the formula, show every line of working, box the final answer with its unit, and add a one-line check. Work in fractions — there is no calculator.

Problem 1 — Work in pairs and wages

A and B can do a piece of work in 12 days, B and C in 15 days, C and A in 20 days. (i) In how many days can all three finish it together? (ii) How long will each take alone? (iii) If all three work together and get Tk 6,000, find each share.

Solution. Let the total work = LCM(12, 15, 20) = 60 units.

A + B = 60/12 = 5 units/day; B + C = 60/15 = 4; C + A = 60/20 = 3.

Adding: 2(A + B + C) = 12 ⇒ A + B + C = 6 units/day.

(i) All three: 60/6 = **10 days**.

(ii) A = 6 − 4 = 2 ⇒ 60/2 = **30 days**; B = 6 − 3 = 3 ⇒ **20 days**; C = 6 − 5 = 1 ⇒ **60 days**.

(iii) Same days worked ⇒ shares ∝ daily work 2 : 3 : 1. One part = 6000/6 = 1000 ⇒ A = **Tk 2,000**, B = **Tk 3,000**, C = **Tk 1,000**.

Check: 1/30 + 1/20 + 1/60 = (2 + 3 + 1)/60 = 1/10 ✔

Problem 2 — Pipes with an outlet closed later

Pipes A and B can fill a tank in 36 min and 45 min. Pipe C can empty it in 30 min. All three are opened together; after 12 min C is closed. In how much time in total will the tank be full?

Solution. Let capacity = LCM(36, 45, 30) = 180 units.

A = +5, B = +4, C = −6 units/min ⇒ all three = +3 units/min.

In the first 12 min: 12 × 3 = 36 units filled. Remaining = 180 − 36 = 144 units.

After C is closed, A + B = 9 units/min ⇒ time = 144/9 = 16 min.

Total time = 12 + 16 = **28 minutes**.

Check: 36 + 16 × 9 = 36 + 144 = 180 ✔

Problem 3 — Two trains

Two trains of length 140 m and 160 m run on parallel lines at 60 km/h and 40 km/h. Find the time they take to cross each other when moving (i) in opposite directions, (ii) in the same direction.

Solution. Distance to be covered = 140 + 160 = 300 m.

(i) Relative speed = 60 + 40 = 100 km/h = 100 × 5/18 = 250/9 m/s. Time = 300 ÷ 250/9 = 300 × 9/250 = **10.8 s**.

(ii) Relative speed = 60 − 40 = 20 km/h = 20 × 5/18 = 50/9 m/s. Time = 300 × 9/50 = **54 s**.

Check: the ratio of times 54 : 10.8 = 5 : 1 equals the inverse ratio of relative speeds 100 : 20 ✔

Problem 4 — Boat: two trips, two unknowns

A boat covers 24 km upstream and 36 km downstream in 6 hours, and 36 km upstream and 24 km downstream in 6½ hours. Find the speed of the boat in still water and the speed of the stream.

Solution. Let upstream speed = U and downstream speed = D. Put p = 1/U, q = 1/D.

24p + 36q = 6 ...(i) 36p + 24q = 13/2 ...(ii)

(i) + (ii): 60(p + q) = 25/2 ⇒ p + q = 5/24.

(ii) − (i): 12(p − q) = 1/2 ⇒ p − q = 1/24.

⇒ p = 6/48 = 1/8, q = 4/48 = 1/12 ⇒ U = 8 km/h, D = 12 km/h.

Boat = (12 + 8)/2 = **10 km/h**; stream = (12 − 8)/2 = **2 km/h**.

Check: 24/8 + 36/12 = 3 + 3 = 6 h ✔; 36/8 + 24/12 = 4.5 + 2 = 6.5 h ✔

Problem 5 — Mixture: removal and addition

A vessel has 60 L of milk and water in the ratio 2 : 1. 15 L of the mixture is taken out and replaced with water. (i) Find the new ratio. (ii) How much milk must now be added to make the ratio 3 : 2?

Solution. Milk = 60 × 2/3 = 40 L; water = 20 L.

15 L of mixture removed contains milk 15 × 2/3 = 10 L and water 5 L.

Left: milk 30 L, water 15 L; then add 15 L water ⇒ water 30 L.

(i) New ratio = 30 : 30 = **1 : 1**.

(ii) Let x L of milk be added: (30 + x)/30 = 3/2 ⇒ 30 + x = 45 ⇒ **x = 15 L**.

Check: 45 : 30 = 3 : 2 ✔

Problem 6 — LCM with an extra condition

Find the least number which, when divided by 12, 16, 18 and 30, leaves remainder 4 in each case, but is exactly divisible by 7.

Solution. $12 = 2^2 \cdot 3$, $16 = 2^4$, $18 = 2 \cdot 3^2$, $30 = 2 \cdot 3 \cdot 5$ ⇒ LCM = $2^4 \times 3^2 \times 5 = 720$.

Required number N = 720k + 4 for some whole number k.

720 = 7 × 102 + 6 ⇒ N ≡ 6k + 4 (mod 7). Try k = 1, 2, 3, 4: 6k + 4 = 10, 16, 22, 28 ⇒ 28 is divisible by 7 when k = 4.

N = 720 × 4 + 4 = **2884**.

Check: 2884 ÷ 7 = 412 ✔; 2884 − 4 = 2880 = 720 × 4, so remainder 4 for 12, 16, 18, 30 ✔

Problem 7 — Late and early

Travelling at 40 km/h a man reaches his office 10 minutes late; at 50 km/h he reaches 5 minutes early. Find the distance and the correct time of the journey.

Solution. Let the distance = d km. Difference in times = 10 + 5 = 15 min = 1/4 h.

d/40 − d/50 = 1/4 ⇒ (5d − 4d)/200 = 1/4 ⇒ d = **50 km**.

Time at 40 km/h = 50/40 h = 75 min ⇒ correct time = 75 − 10 = **65 minutes**.

Check: at 50 km/h time = 60 min = 65 − 5 ✔

Problem 8 — Surd simplification

Simplify: $1/(3-\sqrt{8}) - 1/(\sqrt{8}-\sqrt{7}) + 1/(\sqrt{7}-\sqrt{6}) - 1/(\sqrt{6}-\sqrt{5}) + 1/(\sqrt{5}-2)$.

Solution. Rationalise each term: $1/(\sqrt{a}-\sqrt{b}) = (\sqrt{a}+\sqrt{b})/(a-b)$, and here every $a-b=1$.

$1/(3-\sqrt{8}) = 3+\sqrt{8}$; $1/(\sqrt{8}-\sqrt{7}) = \sqrt{8}+\sqrt{7}$; $1/(\sqrt{7}-\sqrt{6}) = \sqrt{7}+\sqrt{6}$; $1/(\sqrt{6}-\sqrt{5}) = \sqrt{6}+\sqrt{5}$; $1/(\sqrt{5}-2) = \sqrt{5}+2$.

Expression $= (3+\sqrt{8}) - (\sqrt{8}+\sqrt{7}) + (\sqrt{7}+\sqrt{6}) - (\sqrt{6}+\sqrt{5}) + (\sqrt{5}+2)$.

All surds cancel $\Rightarrow 3+2 =$ **5**.

Last-minute checklist

Units converted? Rates added (not days)? Platform length added? Upstream = b − s? Milk (the fixed part) kept constant? "Greatest … divides" = HCF, "least … divisible" = LCM? Powers reduced mod 4 for unit digits?

Chapter 3 — Algebra, Counting, Probability, Geometry, Data

Identities · Equations · Quadratics · Indices & Logs · Inequalities · Sets · P&C · Probability · Mensuration · Data Interpretation

These topics appear in almost every bank IT paper: an identity or `x + 1/x` question in the MCQ, and one probability, handshake, sets or simultaneous-equation problem in the written part (BSCS AME/AE 24.01.2026 had exactly "probability + handshake" as its 2 math questions). Every past question from the sources is solved below in a **Past question** box.

3.1 Algebraic Identities and Factorisation

3.1.1 Identities to memorise

$$(a+b)^2 = a^2 + 2ab + b^2 \quad | \quad (a-b)^2 = a^2 - 2ab + b^2 \quad | \quad a^2 - b^2 = (a+b)(a-b)$$
$$(a+b)^2 + (a-b)^2 = 2(a^2 + b^2) \quad | \quad (a+b)^2 - (a-b)^2 = 4ab$$
$$(a+b)^3 = a^3 + b^3 + 3ab(a+b) \quad | \quad (a-b)^3 = a^3 - b^3 - 3ab(a-b)$$
$$a^3 + b^3 = (a+b)(a^2 - ab + b^2) \quad | \quad a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$
$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$$
$$a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$$

The x + 1/x family (comes almost every year)

$x^2 + 1/x^2 = (x + 1/x)^2 - 2 = (x - 1/x)^2 + 2$

$(x - 1/x)^2 = (x + 1/x)^2 - 4$

$x^3 + 1/x^3 = (x + 1/x)^3 - 3(x + 1/x)$ · $x^3 - 1/x^3 = (x - 1/x)^3 + 3(x - 1/x)$

$x^4 + 1/x^4 = (x^2 + 1/x^2)^2 - 2$

Shortcuts

- If $a + b + c = 0$, then $a^3 + b^3 + c^3 = 3abc$.
- From $x + y = A$ and $x - y = B$: $x = (A + B)/2$, $y = (A - B)/2$, $xy = (A^2 - B^2)/4$.
- Check any identity answer by putting a small number (e.g. $a = 2$, $b = 1$) into both sides.

Example 1

If $x + 1/x = 3$, find $x^2 + 1/x^2$ and $x^3 + 1/x^3$.

$x^2 + 1/x^2 = 3^2 - 2 =$ **7**

$x^3 + 1/x^3 = 3^3 - 3 \times 3 = 27 - 9 =$ **18**

Example 2

If $a + b = 7$ and $ab = 12$, find $a^2 + b^2$ and $a - b$.

$a^2 + b^2 = (a + b)^2 - 2ab = 49 - 24 =$ **25**

$(a - b)^2 = (a + b)^2 - 4ab = 49 - 48 = 1 \Rightarrow a - b =$ **±1** (a, b are 4 and 3 in some order)

Example 3

If $x - y = 4$ and $xy = 21$, find $x^2 + y^2$ and $x^3 - y^3$.

$x^2 + y^2 = (x - y)^2 + 2xy = 16 + 42 =$ **58**

$x^3 - y^3 = (x - y)^3 + 3xy(x - y) = 64 + 3 \times 21 \times 4 = 64 + 252 =$ **316**

Past question BB AP 2023

If x is an integer and $x + 1/x = 17/4$, find $x - 1/x$.

$17/4 = 4 + 1/4$, so $x = 4$ or $x = 1/4$. Since x is an integer, $x = 4$.

$x - 1/x = 4 - 1/4 =$ **15/4**

Alternative: $(x - 1/x)^2 = (x + 1/x)^2 - 4 = 289/16 - 64/16 = 225/16 \Rightarrow x - 1/x = \pm 15/4$; for $x = 4$ it is positive $\Rightarrow 15/4$.

Past question Officer IT 2026

If $x + 1/x = 7$, then $x^2 + 1/x^2 = ?$

$x^2 + 1/x^2 = 7^2 - 2 = 49 - 2 =$ **47** (if 47 is not among the options, the question was misprinted — do not guess under negative marking).

Past question Officer IT 2026

If $x + y = A$ and $x - y = B$, then $xy = ?$

$(x + y)^2 - (x - y)^2 = 4xy \Rightarrow A^2 - B^2 = 4xy \Rightarrow xy =$ **$(A^2 - B^2)/4$**

3.1.2 Factorisation methods

Method	When to use	Example
Common factor	Every term shares a factor	$6x^2y - 9xy^2 = 3xy(2x - 3y)$
Grouping	4 terms	$ax + ay + bx + by = (a + b)(x + y)$
Middle-term split	$ax^2 + bx + c$: find two numbers with product ac and sum b	$6x^2 - 7x - 3$: $ac = -18$, numbers -9 and $2 \Rightarrow 6x^2 - 9x + 2x - 3 = (2x - 3)(3x + 1)$
Difference of squares	$\square^2 - \triangle^2$	$9a^2 - 16b^2 = (3a - 4b)(3a + 4b)$
Sum/difference of cubes	$\square^3 \pm \triangle^3$	$a^3 - 8 = (a - 2)(a^2 + 2a + 4)$
Add and subtract	x^4 terms that "almost" make a square	$x^4 + x^2 + 1 = (x^2 + 1)^2 - x^2 = (x^2 + x + 1)(x^2 - x + 1)$

Past question Officer IT 2026

Factorise $4x^4 + 1$.

Add and subtract $4x^2$: $4x^4 + 4x^2 + 1 - 4x^2 = (2x^2 + 1)^2 - (2x)^2$

= **$(2x^2 + 2x + 1)(2x^2 - 2x + 1)$**

Traps

- $(a + b)^2 \neq a^2 + b^2$. Students lose marks by dropping $2ab$.
- $a^2 + b^2$ cannot be factorised over real numbers; $a^3 + b^3$ can.
- When $x - 1/x$ is found from a square, keep $\pm$ unless the question fixes the sign (integer, positive, $x > 1$).

3.2 Linear and Simultaneous Equations

Methods

Substitution: make one variable the subject, put it into the other equation.

Elimination: multiply so that one variable has the same coefficient, then add/subtract.

Cross-multiplication for $a_1x + b_1y + c_1 = 0$, $a_2x + b_2y + c_2 = 0$: $x/(b_1c_2 - b_2c_1) = y/(c_1a_2 - c_2a_1) = 1/(a_1b_2 - a_2b_1)$.

Number of solutions: $a_1/a_2 \neq b_1/b_2 \Rightarrow$ one unique solution; $a_1/a_2 = b_1/b_2 \neq c_1/c_2 \Rightarrow$ no solution (parallel lines); all three ratios equal $\Rightarrow$ infinitely many.

Shortcuts

- If the two equations are "mirror images" $(3p + 2q, 2p + 3q)$, add them and subtract them: you get $p + q$ and $p - q$ immediately.
- In MCQ, put the options into the equations (back-substitution) — often faster than solving.

Example 1 — elimination

Solve $2x + 3y = 13$ and $3x - 2y = 0$.

(i) × 2: $4x + 6y = 26$; (ii) × 3: $9x - 6y = 0$. Add: $13x = 26 \Rightarrow x = 2$. Then $3(2) - 2y = 0 \Rightarrow y = 3$.

$x = 2, y = 3$ (check: $4 + 9 = 13$ ✔, $6 - 6 = 0$ ✔)

Example 2 — mirror equations

3 pens and 2 pencils cost Tk 55; 2 pens and 3 pencils cost Tk 45. Price of each?

Let pen = p, pencil = q. $3p + 2q = 55$, $2p + 3q = 45$.

Add: $5p + 5q = 100 \Rightarrow p + q = 20$. Subtract: $p - q = 10$.

$\Rightarrow$ **pen Tk 15, pencil Tk 5** (check: $45 + 10 = 55$ ✔)

Example 3 — two-digit number

The sum of the digits of a two-digit number is 9. If the digits are reversed, the number increases by 27. Find the number.

Let tens digit = a, units digit = b; number = 10a + b.

a + b = 9 ...(i); (10b + a) − (10a + b) = 27 ⇒ 9(b − a) = 27 ⇒ b − a = 3 ...(ii)

⇒ b = 6, a = 3 ⇒ number = **36** (check: 63 − 36 = 27 ✔)

Example 4 — fraction

If 1 is added to both numerator and denominator, a fraction becomes 1/2; if 1 is subtracted from both, it becomes 1/3. Find the fraction.

Let it be x/y. 2(x + 1) = y + 1 ⇒ y = 2x + 1; 3(x − 1) = y − 1 ⇒ y = 3x − 2.

2x + 1 = 3x − 2 ⇒ x = 3, y = 7 ⇒ **3/7** (check: 4/8 = 1/2 ✔, 2/6 = 1/3 ✔)

Past question BB AP 2023

Students of a class are made to stand in rows. If 4 students are extra in each row, there would be 2 rows less. If 4 students are less in each row, there would be 4 more rows. Find the number of students.

Let x = students per row, y = number of rows; total = xy.

(x + 4)(y − 2) = xy ⇒ −2x + 4y − 8 = 0 ⇒ x = 2y − 4 ...(i)

(x − 4)(y + 4) = xy ⇒ 4x − 4y − 16 = 0 ⇒ x = y + 4 ...(ii)

From (i) and (ii): 2y − 4 = y + 4 ⇒ y = 8, x = 12 ⇒ total = **96 students**

Check: 16 × 6 = 96 ✔, 8 × 12 = 96 ✔

Traps

In "reversed digits" problems, write the number as 10a + b, never as "ab" (which means a × b). Always write "Let ..." — examiners give a mark for defining variables.

3.3 Quadratic Equations

$$ax^2 + bx + c = 0\ (a \neq 0) \Rightarrow x = [-b \pm \sqrt{(b^2 - 4ac)}] / 2a$$

$$\text{Discriminant } D = b^2 - 4ac \ \mid\ \alpha + \beta = -b/a \ \mid\ \alpha\beta = c/a$$

$$\text{Equation with roots } \alpha, \beta: x^2 - (\alpha + \beta)x + \alpha\beta = 0$$

Discriminant	Nature of roots
D > 0 and a perfect square (a, b, c rational)	Real, unequal, rational — factorisable
D > 0, not a perfect square	Real, unequal, irrational (come in pairs $p \pm \sqrt{q}$)
D = 0	Real and equal: x = −b/2a
D < 0	No real roots (complex)

Useful results from α + β and αβ

$\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta$ · $(\alpha - \beta)^2 = (\alpha + \beta)^2 - 4\alpha\beta$ · $1/\alpha + 1/\beta = (\alpha + \beta)/\alpha\beta$ · $\alpha^3 + \beta^3 = (\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)$

Example 1 — factorising

Solve $2x^2 - 7x + 3 = 0$. ac = 6; numbers −6 and −1 ⇒ $2x^2 - 6x - x + 3 = 2x(x - 3) - 1(x - 3) = (2x - 1)(x - 3) = 0$ ⇒ **x = 1/2 or 3**

Example 2 — formula

Solve $x^2 - 4x - 1 = 0$. $D = 16 + 4 = 20$ ⇒ $x = (4 \pm \sqrt{20})/2 = (4 \pm 2\sqrt{5})/2 = \mathbf{2 \pm \sqrt{5}}$

Example 3 — sum and product

If α, β are the roots of $x^2 - 5x + 6 = 0$, find $\alpha^2 + \beta^2$ and $1/\alpha + 1/\beta$.
$\alpha + \beta = 5$, $\alpha\beta = 6$ ⇒ $\alpha^2 + \beta^2 = 25 - 12 =$ **13**; $1/\alpha + 1/\beta = 5/6$ ⇒ **5/6**

Example 4 — equal roots

For what k does $x^2 + kx + 9 = 0$ have equal roots? $D = k^2 - 36 = 0$ ⇒ **k = ±6**

Example 5 — forming an equation

Roots 3 and −5: sum = −2, product = −15 ⇒ $\mathbf{x^2 + 2x - 15 = 0}$

Example 6 — word problem

The product of two consecutive positive integers is 132. Find them.
$x(x + 1) = 132$ ⇒ $x^2 + x - 132 = 0$ ⇒ $(x + 12)(x - 11) = 0$ ⇒ x = 11 (reject −12, not positive) ⇒ **11 and 12**

Traps

- Never divide both sides by x — you lose the root x = 0 ($x^2 = 5x$ ⇒ x = 0 or 5).
- In word problems, reject negative lengths, ages or counts, and **say why** in one line.
- Sum of roots is −b/a (minus sign!), product is c/a.

3.4 Indices, Surds and Logarithms

3.4.1 Laws of indices

$$a^m \cdot a^n = a^{m+n} \;|\; a^m / a^n = a^{m-n} \;|\; (a^m)^n = a^{mn} \;|\; (ab)^n = a^n b^n$$
$$a^0 = 1\ (a \neq 0) \;|\; a^{-n} = 1/a^n \;|\; a^{(m/n)} = \sqrt[n]{(a^m)} \;|\; \text{If } a^x = a^y\ (a \neq 0, 1) \text{ then } x = y$$

Shortcut — make the bases equal

Write every number as a power of a prime: $8 = 2^3$, $32 = 2^5$, $64 = 2^6$, $81 = 3^4$, $125 = 5^3$, $243 = 3^5$, $0.25 = 2^{-2}$. Then compare exponents.

Past question Officer IT 2026

If $2^{x+3} = 32$, then x = ?

$32 = 2^5 \Rightarrow 2^{x+3} = 2^5 \Rightarrow x + 3 = 5 \Rightarrow \mathbf{x = 2}$

Examples

(i) $4^x = 8^{x-1} \Rightarrow 2^{2x} = 2^{3x-3} \Rightarrow 2x = 3x - 3 \Rightarrow \mathbf{x = 3}$

(ii) $27^{(2/3)} = (\sqrt[3]{27})^2 = 3^2 = \mathbf{9}$; $64^{(-2/3)} = 1/(\sqrt[3]{64})^2 = \mathbf{1/16}$

(iii) $3^x + 3^{x+1} = 36 \Rightarrow 3^x(1 + 3) = 36 \Rightarrow 3^x = 9 \Rightarrow \mathbf{x = 2}$

3.4.2 Surds — rationalising

Rule

Multiply numerator and denominator by the conjugate: $1/(\sqrt{a} - \sqrt{b}) = (\sqrt{a} + \sqrt{b})/(a - b)$. Use $(\sqrt{a} + \sqrt{b})^2 = a + b + 2\sqrt{ab}$.

Past question BB AME 2023

Find the value of $4(\sqrt{6} + \sqrt{2})/(\sqrt{6} - \sqrt{2}) - (2 + \sqrt{3})/(2 - \sqrt{3})$.

$(\sqrt{6} + \sqrt{2})/(\sqrt{6} - \sqrt{2}) = (\sqrt{6} + \sqrt{2})^2/(6 - 2) = (8 + 2\sqrt{12})/4 = (8 + 4\sqrt{3})/4 = 2 + \sqrt{3} \Rightarrow$ first term $= 4(2 + \sqrt{3}) = 8 + 4\sqrt{3}$

$(2 + \sqrt{3})/(2 - \sqrt{3}) = (2 + \sqrt{3})^2/(4 - 3) = 4 + 4\sqrt{3} + 3 = 7 + 4\sqrt{3}$

Value $= (8 + 4\sqrt{3}) - (7 + 4\sqrt{3}) = \mathbf{1}$

3.4.3 Logarithms

$$\log_a x = y \Leftrightarrow a^y = x \ (a > 0, a \neq 1, x > 0)$$

$$\log(mn) = \log m + \log n \ \mid \ \log(m/n) = \log m - \log n \ \mid \ \log m^n = n \log m$$

$$\log_a a = 1 \ \mid \ \log_a 1 = 0 \ \mid \ \log_a b = \log b / \log a \ \mid \ a^{(\log_a x)} = x$$

Examples

(i) $\log_2 64 = \mathbf{6}$ ($2^6 = 64$); $\log_{\sqrt{2}} 8 = \mathbf{6}$ since $(\sqrt{2})^6 = 2^3 = 8$.

(ii) $\log_x 81 = 4 \Rightarrow x^4 = 81 = 3^4 \Rightarrow \mathbf{x = 3}$

(iii) Given log 2 = 0.3010: log 8 = 3 × 0.3010 = **0.9030**; log 5 = log(10/2) = 1 − 0.3010 = **0.6990**

(iv) Number of digits in 2^{30}: $\log 2^{30} = 30 \times 0.30103 = 9.03 \Rightarrow$ characteristic 9 ⇒ **10 digits** (2^{30} = 1,073,741,824)

(v) $\log(x + 3) + \log(x - 3) = \log 16 \Rightarrow x^2 - 9 = 16 \Rightarrow x = \pm 5$; log needs $x - 3 > 0 \Rightarrow \mathbf{x = 5}$

Traps

$\log(m + n) \neq \log m + \log n$. log of zero or a negative number is undefined — always check the answer in the original equation.

3.5 Inequalities

Rules

- Adding/subtracting the same number keeps the sign.
- Multiplying/dividing by a **positive** number keeps the sign; by a **negative** number **reverses** it.
- If $a > b > 0$ then $1/a < 1/b$ (taking reciprocals of same-sign numbers reverses the sign).
- $|x - a| < k \Leftrightarrow a - k < x < a + k$; $|x - a| > k \Leftrightarrow x < a - k$ or $x > a + k$.
- $(x - a)(x - b) < 0$ with $a < b \Leftrightarrow a < x < b$ (between the roots); $> 0 \Leftrightarrow$ outside the roots.

Examples

(i) $3x - 5 < 2x + 4 \Rightarrow$ **$x < 9$**

(ii) $-2x + 3 \geq 11 \Rightarrow -2x \geq 8 \Rightarrow$ **$x \leq -4$** (sign reversed on dividing by -2)

(iii) $|x - 3| < 5 \Rightarrow -5 < x - 3 < 5 \Rightarrow$ **$-2 < x < 8$**

(iv) $x^2 - 5x + 6 < 0 \Rightarrow (x - 2)(x - 3) < 0 \Rightarrow$ **$2 < x < 3$**

Past question AP 17.01.2026

If $2 < x < 5$ and $3 < y < 5$, find the range of xy.

Both x and y are positive, so the bounds can be multiplied directly:

minimum $\rightarrow 2 \times 3 = 6$; maximum $\rightarrow 5 \times 5 = 25 \Rightarrow$ **$6 < xy < 25$**

Example — when a variable can be negative

If $-2 < x < 3$ and $1 < y < 4$, find the range of xy and of $x - y$.

xy: check the four corner products: $(-2)(1) = -2$, $(-2)(4) = -8$, $3 \times 1 = 3$, $3 \times 4 = 12 \Rightarrow$ **$-8 < xy < 12$**

$x - y$: smallest = smallest x − largest y $= -2 - 4 = -6$; largest $= 3 - 1 = 2 \Rightarrow$ **$-6 < x - y < 2$**

Traps

For a difference, subtract the **opposite** ends (min x − max y). For a product with negative values, never just multiply the lower bounds — use the four corners.

3.6 Sets and Venn Diagrams

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)$

Neither = Total − $n(A \cup B)$ | Only A = $n(A) - n(A \cap B)$ | Subsets of an n-element set = 2^n (proper subsets $2^n - 1$)

Term	Meaning	Example with A = {1,2,3,4}, B = {3,4,5}
$A \cup B$ (union)	in A or B or both	{1,2,3,4,5}
$A \cap B$ (intersection)	in both	{3,4}
$A - B$ (difference)	in A but not in B	{1,2}

A′ (complement)	in U but not in A	U − A
A Δ B (symmetric difference)	in exactly one of them	{1,2,5}
Disjoint sets	A ∩ B = ∅	{1,2} and {7,8}

Laws

De Morgan: (A ∪ B)′ = A′ ∩ B′ and (A ∩ B)′ = A′ ∪ B′. Distributive: A ∩ (B ∪ C) = (A ∩ B) ∪ (A ∩ C). A = (A − B) ∪ (A ∩ B).

Past question Officer IT 2024

Find sets X and Y if X ∪ Y = {1,2,3,5,6,8,9,10}, X ∩ Y = {1,5}, Y − X = {2,6,9,10}.
Y = (X ∩ Y) ∪ (Y − X) = {1,5} ∪ {2,6,9,10} = **{1, 2, 5, 6, 9, 10}**
X − Y = (X ∪ Y) − Y = {3, 8}
X = (X − Y) ∪ (X ∩ Y) = {3,8} ∪ {1,5} = **{1, 3, 5, 8}**
Check: X ∪ Y = {1,2,3,5,6,8,9,10} ✔, X ∩ Y = {1,5} ✔

Example — two sets

In a group of 100 people, 60 drink tea, 50 drink coffee and 20 drink both. How many drink neither? Only tea?
n(T ∪ C) = 60 + 50 − 20 = 90 ⇒ neither = 100 − 90 = **10**; only tea = 60 − 20 = **40**; only coffee = 30.

3.6.1 Three-set problems — fill the Venn diagram from the centre outwards

Method

1. Write "all three" in the centre. 2. Each "exactly two" region = (given pair) − (all three). 3. Each "only one" region = (set total) − (its two pair-only regions) − (centre). 4. None = Total − sum of all seven regions.

Example — three sets

Of 100 students, 50 study Maths, 40 Physics, 35 Chemistry; 15 study M and P, 10 study P and C, 12 study M and C, and 5 study all three. Find (i) how many study none, (ii) exactly one subject, (iii) exactly two subjects.
Centre = 5. M∩P only = 15 − 5 = 10; P∩C only = 10 − 5 = 5; M∩C only = 12 − 5 = 7.
Only M = 50 − 10 − 7 − 5 = 28; only P = 40 − 10 − 5 − 5 = 20; only C = 35 − 7 − 5 − 5 = 18.
Union = 28 + 20 + 18 + 10 + 5 + 7 + 5 = 93 (formula: 50 + 40 + 35 − 15 − 10 − 12 + 5 = 93 ✔)
(i) None = 100 − 93 = **7** (ii) Exactly one = 28 + 20 + 18 = **66** (iii) Exactly two = 10 + 5 + 7 = **22**

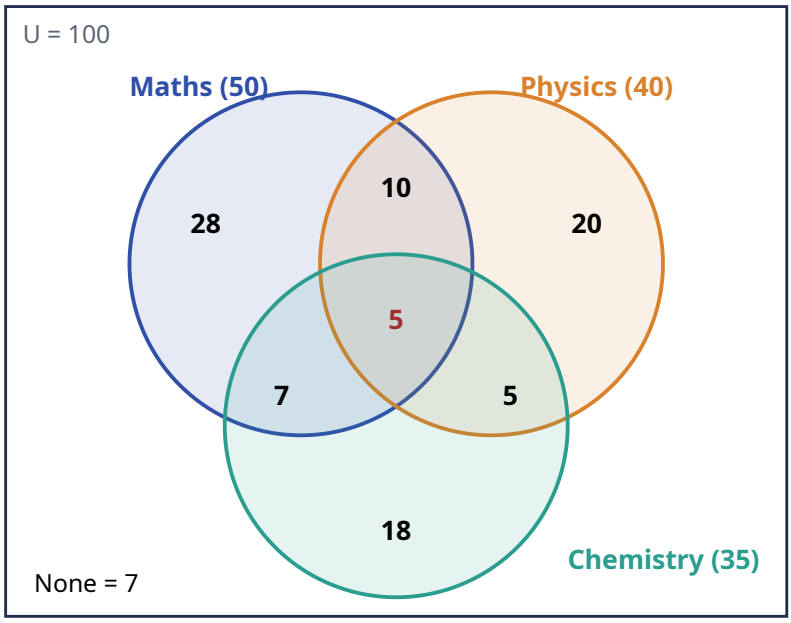


Figure 3.1: Three-set Venn diagram — centre (all three) = 5, pair-only regions 10, 7, 5, single-subject regions 28, 20, 18, outside = 7.

Traps

"Both M and P" given in the question **includes** those who study all three — subtract the centre before writing it in the diagram. "At least two" = exactly two + all three (here 22 + 5 = 27).

3.7 Permutations and Combinations

${}^nP_r = n!/(n-r)!$ (order matters) | ${}^nC_r = n!/[r!(n-r)!]$ (order does not matter)
${}^nC_r = {}^nC_{n-r}$ | ${}^nP_r = r! \times {}^nC_r$ | $0! = 1$
n items with p alike, q alike, ... ⇒ n!/(p! q! ...) | Circular arrangement of n ⇒ (n − 1)! (necklace/garland: (n − 1)!/2)
Handshakes / lines from n points = ${}^nC_2 = n(n-1)/2$ | Triangles from n points (no 3 collinear) = ${}^nC_3$ | Diagonals of an n-gon = n(n − 3)/2

How to decide P or C

Arranging, ranking, seating, forming numbers/words/passwords ⇒ **Permutation**. Selecting a team, committee, group, handshakes, choosing balls ⇒ **Combination**. "AND" (both steps) ⇒ multiply; "OR" (separate cases) ⇒ add.

Past question BSCS AME/AE 24.01.2026

There are 10 engineers in a room. Every engineer shakes hands with every other engineer exactly once. Find the total number of handshakes.
One handshake needs a pair of 2 people, and the order does not matter ⇒ combination.
Total = ${}^{10}C_2 = 10 \times 9 / 2 =$ **45 handshakes**
(Reverse form: "45 handshakes, how many people?" ⇒ n(n − 1)/2 = 45 ⇒ n(n − 1) = 90 ⇒ n = 10. If 66 handshakes ⇒ n = 12.)

3.7.1 Committees

Example

A committee of 5 is chosen from 6 men and 4 women. In how many ways (i) with exactly 2 women, (ii) with at least one woman?

(i) ${}^4C_2 \times {}^6C_3 = 6 \times 20 = \mathbf{120}$

(ii) Total − no woman = ${}^{10}C_5 - {}^6C_5 = 252 - 6 = \mathbf{246}$

3.7.2 Word arrangements

Examples

(i) BANK: 4 different letters ⇒ 4! = **24**

(ii) LETTER (E×2, T×2) ⇒ 6!/(2! 2!) = 720/4 = **180**

(iii) BANGLADESH: 10 letters, A twice ⇒ 10!/2! = **1,814,400**

(iv) BANGLADESH with all vowels (A, A, E) together: tie them as one block ⇒ 7 consonants + 1 block = 8 units ⇒ 8!; inside the block 3!/2! = 3 ⇒ 40320 × 3 = **120,960**

3.7.3 Numbers and circular arrangements

Examples

(i) 3-digit numbers with distinct digits from 1–9: ${}^9P_3 = 9 \times 8 \times 7 = \mathbf{504}$

(ii) 3-digit **even** numbers from 1, 2, 3, 4, 5 without repetition: fill the restricted place first — units place 2 ways (2 or 4), then 4 × 3 ⇒ **24**

(iii) 6 people around a round table: (6 − 1)! = **120**; if two particular people must sit together: tie them ⇒ 5 units ⇒ 4! × 2! = **48**

(iv) Diagonals of a decagon: 10 × 7/2 = **35**

Traps

- Fill the **restricted** position first (units digit for even numbers, first digit cannot be 0).
- "At least one" ⇒ use Total − None; adding cases is slower and error-prone.
- Circular: (n − 1)!, not n!. For identical-looking garlands/necklaces divide again by 2.

3.8 Probability

$P(E) = \text{favourable outcomes} / \text{total equally likely outcomes},\ 0 \le P(E) \le 1$ | $P(\text{not } E) = 1 - P(E)$

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ | Independent: $P(A \text{ and } B) = P(A) \times P(B)$

$P(\text{at least one}) = 1 - P(\text{none})$ | Odds in favour a : b ⇒ P = a/(a + b)

Experiment	Sample space	Remember
n coins	2^n (2 coins: 4, 3 coins: 8)	Exactly k heads: ${}^nC_k / 2^n$
n dice	6^n (2 dice: 36)	Sum 7 is the most likely (6 ways); doublets 6

Cards	52 = 4 suits × 13	26 red, 26 black, 4 of each rank, 12 face cards (J, Q, K)
Balls in a bag	${}^{N}C_{r}$ (N = total balls, r drawn)	Without replacement ⇒ use combinations

Sum of two dice	2	3	4	5	6	7	8	9	10	11	12
Ways (out of 36)	1	2	3	4	5	6	5	4	3	2	1

3.8.1 Coins and dice

Past question Officer IT 2024

Two unbiased dice are thrown. What is the probability that the sum is 7?

n(S) = 6 × 6 = 36. Favourable: (1,6), (2,5), (3,4), (4,3), (5,2), (6,1) = 6

P = 6/36 = **1/6**

Past question Officer IT 2026

Two coins are tossed. Probability of exactly one head?

S = {HH, HT, TH, TT}; favourable {HT, TH} ⇒ 2/4 = **1/2**

Examples

(i) Three coins, at least 2 heads: {HHT, HTH, THH, HHH} = 4/8 = **1/2**; at least one head = 1 − 1/8 = **7/8**

(ii) Two dice, sum 8: (2,6),(3,5),(4,4),(5,3),(6,2) ⇒ **5/36**; sum 10 or more: 3 + 2 + 1 = 6 ⇒ **1/6**; a doublet: **6/36 = 1/6**

3.8.2 Cards and balls

Examples

(i) One card from 52: P(king) = 4/52 = **1/13**; P(face card) = 12/52 = **3/13**

(ii) P(red or king) = 26/52 + 4/52 − 2/52 = 28/52 = **7/13** (subtract the 2 red kings counted twice)

(iii) Two cards without replacement, both aces: 4/52 × 3/51 = **1/221**

(iv) Bag of 5 red, 3 blue; 2 drawn together. Both red: ${}^{5}C_{2}/{}^{8}C_{2}$ = 10/28 = **5/14**; one of each: (5 × 3)/28 = **15/28**

3.8.3 At least one and independent events

Past question BSCS AME/AE 24.01.2026

A machine produces defective items at a rate of 25%. If n items are selected, what is the probability that at least one item is defective?

(The number of items is printed unclearly in the source collection — most likely 10. The general method and the values for n = 10 and n = 5 are given.)

P(an item is good) = 1 − 0.25 = 0.75; items are independent ⇒ P(none defective) = $(0.75)^{n}$

P(at least one defective) = **$1 - (0.75)^{n}$**

n = 10: $(0.75)^{10} \approx 0.0563$ ⇒ P ≈ **0.9437 (about 94.4%)**

n = 5: $(0.75)^{5} \approx 0.2373$ ⇒ P ≈ **0.7627**

Example — independent events

A can hit a target with probability 1/2, B with probability 2/3. Both shoot once. Find P(both hit) and P(target is hit).

P(both) = 1/2 × 2/3 = **1/3**

P(hit) = 1 − P(both miss) = 1 − (1/2)(1/3) = **5/6**

Traps

- "Mutually exclusive" (cannot happen together, P(A and B) = 0) is **not** the same as "independent" (one does not affect the other).
- With replacement ⇒ probabilities stay the same each draw; without replacement ⇒ the denominator falls by 1.
- A probability above 1 or below 0 means an error — recheck.

3.9 Mensuration and Basic Geometry

3.9.1 Plane figures (2-D)

Figure	Area	Perimeter / other
Rectangle (l × b)	$l \times b$	$2(l + b)$; diagonal $\sqrt{(l^2 + b^2)}$
Square (side a)	$a^2 = d^2/2$	$4a$; diagonal $a\sqrt{2}$
Triangle	½ × base × height	Heron: $\sqrt{[s(s-a)(s-b)(s-c)]}$, $s = (a+b+c)/2$
Equilateral triangle (side a)	$(\sqrt{3}/4)a^2$	height $(\sqrt{3}/2)a$
Circle (radius r)	πr^2	circumference $2\pi r$; semicircle perimeter $\pi r + 2r$
Sector (angle θ)	$(\theta/360)\,\pi r^2$	arc length $(\theta/360)\,2\pi r$
Trapezium	½ (sum of parallel sides) × height	—
Parallelogram	base × height	$2(a + b)$
Rhombus	½ $d_1\,d_2$	$4a$, where $a^2 = (d_1/2)^2 + (d_2/2)^2$

3.9.2 Solids (3-D)

Solid	Volume	Curved/lateral surface	Total surface
Cuboid (l, b, h)	lbh	$2h(l + b)$ (four walls)	$2(lb + bh + hl)$; diagonal $\sqrt{(l^2 + b^2 + h^2)}$
Cube (a)	a^3	$4a^2$	$6a^2$; diagonal $a\sqrt{3}$
Cylinder (r, h)	$\pi r^2 h$	$2\pi rh$	$2\pi r(r + h)$
Cone (r, h, slant l)	⅓ $\pi r^2 h$	πrl, $l = \sqrt{(r^2 + h^2)}$	$\pi r(r + l)$
Sphere (r)	⅘ πr^3	$4\pi r^2$	$4\pi r^2$

Hemisphere (r)	$\frac{2}{3}\pi r^3$	$2\pi r^2$		$3\pi r^2$

Shortcuts

- Use $\pi = 22/7$ when the radius is a multiple of 7 ($r = 7 \Rightarrow \pi r^2 = 154$, $2\pi r = 44$; $r = 3.5 \Rightarrow \pi r^2 = 38.5$, $2\pi r = 22$).
- Length +x% and width −y% ⇒ area change = $x - y - xy/100$ %. Every side × k ⇒ area × k^2, volume × k^3.
- 1 m^3 = 1000 litres; 1 hectare = 10,000 m^2.

Past question AP 17.01.2026

A rectangle and a square have the same area. The square has a perimeter of 32 m and the width of the rectangle is 4 m. Find the length of the rectangle.
Side of square = 32/4 = 8 m ⇒ area = $8^2 = 64$ m^2
Length of rectangle = area/width = 64/4 = **16 m**

Past question Officer IT 2026

An open-top box measures 10 m × 7 m × 2 m (height 2 m). Find its surface area.
No lid ⇒ base + four walls = 10 × 7 + 2(10 × 2) + 2(7 × 2) = 70 + 40 + 28 = **138 m^2**

Worked examples

(i) Triangle with sides 13, 14, 15: s = 21 ⇒ area = $\sqrt{(21 \times 8 \times 7 \times 6)} = \sqrt{7056}$ = **84** sq units
(ii) Trapezium with parallel sides 10 cm and 6 cm, height 4 cm: ½(10 + 6) × 4 = **32 cm^2**
(iii) Circle of area 154 cm^2: $r^2 = 154 \times 7/22 = 49 \Rightarrow r = 7$ ⇒ circumference = 2 × 22/7 × 7 = **44 cm**
(iv) Square with diagonal $10\sqrt{2}$ cm: side = 10 ⇒ area **100 cm^2**, perimeter **40 cm**
(v) Cuboid 12 × 8 × 6 cm: volume = **576 cm^3**; total surface = 2(96 + 48 + 72) = **432 cm^2**; diagonal = $\sqrt{244} = 2\sqrt{61} \approx$ **15.62 cm**
(vi) Cylinder r = 7 cm, h = 10 cm: volume = 22/7 × 49 × 10 = **1540 cm^3**; curved surface = 2 × 22/7 × 7 × 10 = **440 cm^2**; total = 440 + 2 × 154 = **748 cm^2**
(vii) Cone r = 3, h = 4: l = 5 ⇒ volume = ⅓π × 9 × 4 = **12π**; curved surface = π × 3 × 5 = **15π**; total = 15π + 9π = **24π**
(viii) Sphere r = 3 cm: volume = ⅘π × 27 = **36π cm^3**; surface = 4π × 9 = **36π cm^2**
(ix) Length of a rectangle +20%, width −20%: 1.2 × 0.8 = 0.96 ⇒ area **decreases by 4%**

3.9.3 Angles, triangles, Pythagoras, polygons

Angle facts

- Complementary angles add to 90°; supplementary to 180°; angles at a point add to 360°.
- Vertically opposite angles are equal. With parallel lines: alternate angles equal, corresponding angles equal, co-interior angles add to 180°.
- Triangle: angle sum 180°; exterior angle = sum of the two opposite interior angles; sum of any two sides > third side; the larger side faces the larger angle.
- Circle: angle in a semicircle = 90°; angle at the centre = 2 × angle at the circumference on the same arc; opposite angles of a cyclic quadrilateral add to 180°.

Pythagoras (right angle at C): $a^2 + b^2 = c^2$ | Triples: 3-4-5, 5-12-13, 8-15-17, 7-24-25 (and multiples: 6-8-10, 9-12-15)
45°-45°-90° sides 1 : 1 : $\sqrt{2}$ | 30°-60°-90° sides 1 : $\sqrt{3}$: 2
Polygon (n sides): interior sum = (n − 2) × 180° | each exterior (regular) = 360°/n | each interior = 180° − 360°/n

Past question Officer IT 2026

A ladder's foot is 4 m from a wall and it reaches a height of 3 m. Length of the ladder?
Wall, ground and ladder form a right triangle ⇒ ladder = $\sqrt{(4^2 + 3^2)} = \sqrt{25}$ = **5 m**

Past question Officer IT 2026

Sum of the interior angles of a hexagon?
(6 − 2) × 180° = **720°** (each angle of a regular hexagon = 120°)

Examples

(i) Each interior angle of a regular polygon is 140°. Number of sides? Exterior = 40° ⇒ n = 360/40 = **9**
(ii) Angles of a triangle are in ratio 2 : 3 : 4 ⇒ 9 parts = 180° ⇒ **40°, 60°, 80°**
(iii) Can 3, 4, 8 be sides of a triangle? 3 + 4 = 7 < 8 ⇒ **No**

Traps

Keep units consistent (convert cm to m before multiplying). "Open box" / "tank without lid" ⇒ drop one face. Area in square units, volume in cubic units — a wrong unit costs a mark in written answers.

3.10 Data Interpretation

Rules for DI

1. Read the title, units (crore, lakh, thousand, %) and the axis start before calculating.
2. % change = (new − old)/old × 100 — the base is always the **old** value.
3. "Percentage point" (98.6% → 97.8% = −0.8 pp) is not the same as "percent change".
4. Approximate first (e.g. 30/210 ≈ 1/7 ≈ 14%) and eliminate options; compute exactly only when two options are close.

3.10.1 Table set

Deposits of four branches of a bank (Tk crore):

Branch	2023	2024	2025
A	120	150	180
B	200	210	240
C	80	100	130
D	150	140	175
Total	**550**	**600**	**725**

#	Question	Working and answer
1	Total deposit in 2025?	180 + 240 + 130 + 175 = **Tk 725 crore**
2	% increase of Branch C from 2023 to 2025?	(130 − 80)/80 × 100 = **62.5%**
3	Average deposit of Branch B over the 3 years?	(200 + 210 + 240)/3 = 650/3 ≈ **Tk 216.67 crore**
4	Which branch's deposit fell in any year?	**D** (150 → 140 in 2024)
5	Ratio of A to D in 2024?	150 : 140 = **15 : 14**
6	Highest % growth from 2024 to 2025?	A 30/150 = 20%, B 30/210 ≈ 14.3%, C 30/100 = 30%, D 35/140 = 25% ⇒ **C**
7	A's share of total deposit in 2023?	120/550 × 100 ≈ **21.8%**
8	% growth of total deposit 2024 → 2025?	125/600 × 100 ≈ **20.83%**

3.10.2 Bar-chart set

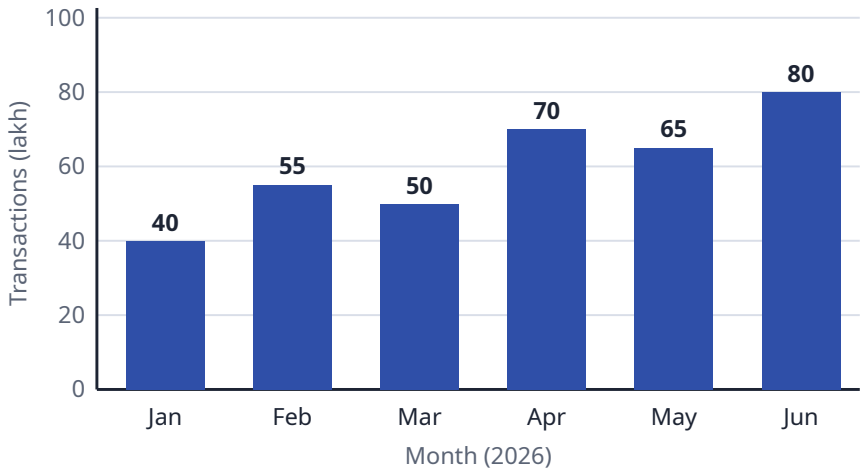


Figure 3.2: Monthly mobile-banking transactions of a bank, January–June (in lakh).

#	Question	Working and answer
1	Total transactions in the six months?	40 + 55 + 50 + 70 + 65 + 80 = **360 lakh**
2	Monthly average?	360/6 = **60 lakh**
3	In how many months was the figure above average?	Apr 70, May 65, Jun 80 ⇒ **3 months**
4	Which month had the highest % increase over the previous month?	Feb +15/40 = 37.5%, Apr +20/50 = 40%, Jun +15/65 ≈ 23.1% ⇒ **April**
5	% decrease from February to March?	5/55 × 100 ≈ **9.09%**
6	Ratio of January to June?	40 : 80 = **1 : 2** (June is 100% more than January)

> **Trap**
>
> The **largest absolute rise** (Feb and Jun, +15; Apr +20) and the **largest % rise** can be different months — read which one the question asks for.

3.11 Practice MCQ

One mark each; −0.25 for a wrong answer. Time yourself: 45 seconds per question.

1. If $a + b = 10$ and $ab = 21$, then $a^2 + b^2 = ?$

(a) 79 (b) 58
(c) 100 (d) 42

Answer: (b) — $(a + b)^2 - 2ab = 100 - 42 = 58$.

2. If $x - 1/x = 3$, then $x^2 + 1/x^2 = ?$

(a) 9 (b) 7
(c) 11 (d) 13

Answer: (c) — $(x - 1/x)^2 + 2 = 9 + 2 = 11$.

3. If $a + b + c = 0$, then $a^3 + b^3 + c^3 = ?$

(a) 0 (b) 3abc

(c) abc (d) a + b + c

Answer: (b) — Standard identity: $a^3 + b^3 + c^3 - 3abc = (a + b + c)(\ldots) = 0$.

4. Sum of the roots of $3x^2 - 5x + 2 = 0$?

(a) 5/3 (b) −5/3

(c) 2/3 (d) −2/3

Answer: (a) — Sum = $-b/a = 5/3$ (product = 2/3).

5. For equal roots of $x^2 - 6x + k = 0$, k = ?

(a) 6 (b) 36

(c) −9 (d) 9

Answer: (d) — $D = 36 - 4k = 0 \Rightarrow k = 9$.

6. If $5^{2x-1} = 125$, then x = ?

(a) 1 (b) 2

(c) 3 (d) 3/2

Answer: (b) — $125 = 5^3 \Rightarrow 2x - 1 = 3 \Rightarrow x = 2$.

7. (64)^(−2/3) = ?

(a) 1/16 (b) 16

(c) 1/8 (d) −16

Answer: (a) — $1/(\sqrt[3]{64})^2 = 1/4^2 = 1/16$.

8. $\log_3 243 = ?$

(a) 3 (b) 4

(c) 5 (d) 6

Answer: (c) — $3^5 = 243$.

9. Solution of 5 − 2x > 11?

(a) x > −3 (b) x < −3

(c) x > 3 (d) x < 3

Answer: (b) — $-2x > 6 \Rightarrow x < -3$ (sign reverses on dividing by −2).

10. Number of subsets of a set with 5 elements?

(a) 10 (b) 25

(c) 32 (d) 31

Answer: (c) — $2^5 = 32$ (proper subsets 31).

11. n(A) = 25, n(B) = 18, n(A ∪ B) = 35. n(A ∩ B) = ?

(a) 8 (b) 7

(c) 10 (d) 43

Answer: (a) — 25 + 18 − 35 = 8.

12. In how many ways can a committee of 3 be chosen from 8 people?

(a) 24 (b) 56
(c) 336 (d) 112

Answer: (b) — ${}^8C_3 = 8 \times 7 \times 6/6 = 56$.

13. Number of arrangements of the letters of APPLE?

(a) 120 (b) 24
(c) 60 (d) 30

Answer: (c) — 5!/2! = 120/2 = 60 (P repeated).

14. In how many ways can 7 people sit around a round table?

(a) 5040 (b) 720
(c) 120 (d) 360

Answer: (b) — (7 − 1)! = 6! = 720.

15. At a meeting there were 66 handshakes, each pair once. Number of people?

(a) 11 (b) 12
(c) 13 (d) 33

Answer: (b) — $n(n-1)/2 = 66 \Rightarrow n(n-1) = 132 \Rightarrow n = 12$.

16. Number of diagonals of a hexagon?

(a) 6 (b) 9
(c) 12 (d) 15

Answer: (b) — $n(n-3)/2 = 6 \times 3/2 = 9$.

17. Two dice are thrown. Probability that the sum is 9?

(a) 1/9 (b) 1/6
(c) 5/36 (d) 1/12

Answer: (a) — (3,6),(4,5),(5,4),(6,3) = 4/36 = 1/9.

18. A card is drawn from 52. Probability it is a heart or a queen?

(a) 17/52 (b) 4/13
(c) 1/4 (d) 1/52

Answer: (b) — 13 + 4 − 1 = 16 ⇒ 16/52 = 4/13.

19. Three coins are tossed. Probability of at least one head?

(a) 1/8 (b) 3/8
(c) 1/2 (d) 7/8

Answer: (d) — 1 − P(no head) = 1 − 1/8 = 7/8.

20. A bag has 4 red and 6 white balls. One ball is drawn. P(red) = ?

(a) 2/3 (b) 2/5
(c) 3/5 (d) 1/4

Answer: (b) — 4/10 = 2/5.

21. Curved surface area of a cylinder with r = 7 cm, h = 5 cm (π = 22/7)?

(a) 110 cm^2 (b) 154 cm^2
(c) 220 cm^2 (d) 770 cm^2

Answer: (c) — $2\pi rh = 2 \times 22/7 \times 7 \times 5 = 220\ cm^2$.

22. Each interior angle of a regular octagon?

(a) 120° (b) 135°
(c) 140° (d) 150°

Answer: (b) — $180° - 360°/8 = 180° - 45° = 135°$.

23. The two legs of a right triangle are 8 cm and 15 cm. Hypotenuse?

(a) 17 cm (b) 23 cm
(c) 13 cm (d) 16 cm

Answer: (a) — $\sqrt{(64 + 225)} = \sqrt{289} = 17$ (8-15-17 triple).

24. Volume of a sphere of radius 3 cm?

(a) 9π cm^3 (b) 27π cm^3
(c) 36π cm^3 (d) 12π cm^3

Answer: (c) — $\frac{4}{3}\ \pi \times 27 = 36\pi\ cm^3$.

3.12 Written Practice (5 marks each)

Write every answer in this order: **Let …** (define) → equation/formula → substitution → solve → boxed answer → one-line check. Work in fractions; there is no calculator.

Problem 1 — identities

If $a + 1/a = 4$, find (i) $a^3 + 1/a^3$ and (ii) $a^4 + 1/a^4$.

Solution. Given $a + 1/a = 4$.

(i) $a^3 + 1/a^3 = (a + 1/a)^3 - 3 \cdot a \cdot (1/a)(a + 1/a) = 4^3 - 3 \times 4 = 64 - 12 =$ **52**

(ii) $a^2 + 1/a^2 = (a + 1/a)^2 - 2 = 16 - 2 = 14$

$a^4 + 1/a^4 = (a^2 + 1/a^2)^2 - 2 = 196 - 2 =$ **194**

Problem 2 — simultaneous equations

200 tickets for a seminar were sold, adults at Tk 50 and children at Tk 30. Total collection was Tk 8,400. How many tickets of each type were sold?

Solution. Let adult tickets = a, child tickets = c.

$a + c = 200$ …(i) $\quad 50a + 30c = 8400$ …(ii)

From (i): $c = 200 - a$. Put in (ii): $50a + 30(200 - a) = 8400 \Rightarrow 50a + 6000 - 30a = 8400 \Rightarrow 20a = 2400 \Rightarrow a = 120$

$c = 200 - 120 = 80$

Adults 120, children 80. Check: $120 \times 50 + 80 \times 30 = 6000 + 2400 = 8400$ ✔

Problem 3 — quadratic word problem

The length of a rectangular garden is 5 m more than its width and its area is 150 m^2. Find its perimeter and the cost of fencing it at Tk 40 per metre.

Solution. Let width = x m; length = (x + 5) m.

$x(x + 5) = 150 \Rightarrow x^2 + 5x - 150 = 0 \Rightarrow x^2 + 15x - 10x - 150 = 0 \Rightarrow (x + 15)(x - 10) = 0$

$x = 10$ or $x = -15$; width cannot be negative $\Rightarrow$ x = 10 m, length = 15 m

Perimeter = 2(15 + 10) = **50 m**; cost of fencing = 50 × 40 = **Tk 2,000**

Check: 15 × 10 = 150 ✔

Problem 4 — sets (two-set Venn)

In a survey of 200 bank customers, 120 use mobile banking, 90 use internet banking and 40 use both. Find the number who use (i) neither, (ii) only mobile banking, (iii) exactly one of the two services.

Solution. Let M = mobile-banking users, I = internet-banking users. n(U) = 200, n(M) = 120, n(I) = 90, $n(M \cap I) = 40$.

$n(M \cup I) = n(M) + n(I) - n(M \cap I) = 120 + 90 - 40 = 170$

(i) Neither = 200 − 170 = **30**

(ii) Only M = 120 − 40 = **80** (only I = 90 − 40 = 50)

(iii) Exactly one = 80 + 50 = **130**

Check: 80 + 40 + 50 + 30 = 200 ✔

Problem 5 — committees

A committee of 5 is to be formed from 7 men and 5 women. In how many ways can it be formed if it contains (i) exactly 2 women, (ii) at least one woman, (iii) at most 2 women?

Solution. Total people = 12.

(i) 2 women and 3 men: ${}^5C_2 \times {}^7C_3 = 10 \times 35 =$ **350**

(ii) At least one woman = all committees − committees with no woman = ${}^{12}C_5 - {}^7C_5 = 792 - 21 =$ **771**

(iii) At most 2 women = (0 W, 5 M) + (1 W, 4 M) + (2 W, 3 M)

$= {}^7C_5 + {}^5C_1 \times {}^7C_4 + {}^5C_2 \times {}^7C_3 = 21 + 5 \times 35 + 10 \times 35 = 21 + 175 + 350 =$ **546**

Problem 6 — probability without replacement

A bag contains 6 red and 4 blue balls. Two balls are drawn at random without replacement. Find the probability that (i) both are red, (ii) one is red and one is blue, (iii) at least one is blue.

Solution. Total ways to choose 2 from 10 = ${}^{10}C_2 = 45$.

(i) Both red: ${}^6C_2 = 15 \Rightarrow P = 15/45 =$ **1/3**

(ii) One of each: ${}^6C_1 \times {}^4C_1 = 24 \Rightarrow P = 24/45 =$ **8/15**

(iii) At least one blue = 1 − P(both red) = 1 − 1/3 = **2/3**

Check: both blue = ${}^4C_2/45 = 6/45$; 15 + 24 + 6 = 45 ✔

Problem 7 — independent events / at least one

Three independent security systems detect an intrusion with probabilities 0.9, 0.8 and 0.7. Find the probability that (i) all three detect it, (ii) at least one detects it, (iii) exactly one detects it.

Solution. Miss probabilities are 0.1, 0.2, 0.3.

(i) P(all) = 0.9 × 0.8 × 0.7 = **0.504**

(ii) P(at least one) = 1 − P(all miss) = 1 − 0.1 × 0.2 × 0.3 = 1 − 0.006 = **0.994**

(iii) P(exactly one) = 0.9 × 0.2 × 0.3 + 0.1 × 0.8 × 0.3 + 0.1 × 0.2 × 0.7 = 0.054 + 0.024 + 0.014 = **0.092**

Problem 8 — mensuration (cylinder)

A cylindrical water tank has radius 3.5 m and height 10 m. (i) How many litres does it hold? (ii) How long will a pipe delivering 1,100 litres per minute take to fill it? (iii) What is the cost of painting its curved surface at Tk 25 per m^2?

Solution. r = 3.5 m = 7/2 m, h = 10 m, π = 22/7.

(i) Volume = $\pi r^2 h$ = 22/7 × 49/4 × 10 = 385 m^3 = 385 × 1000 = **3,85,000 litres**

(ii) Time = 385000/1100 = 350 minutes = **5 hours 50 minutes**

(iii) Curved surface = $2\pi rh$ = 2 × 22/7 × 7/2 × 10 = 220 m^2 ⇒ cost = 220 × 25 = **Tk 5,500**

Chapter 4 — English Grammar and Vocabulary

Grammar items, error correction, vocabulary — for the MCQ English questions and the written "English Language Proficiency" part

English appears in two places: a few MCQs (bank IT MCQ papers mix English with Bangla, math and GK) and the written part (AP 17.01.2026: **10 grammar items** + paragraph + sentence making). Grammar items are the fastest marks in the paper: each one tests a single fixed rule. This chapter gives those rules in the order they are tested most, then the vocabulary lists, then practice. Paragraph, letter, focus writing and translation are in Chapter 5.

> **How to use this chapter in the last 48 hours**
>
> 1) Read every **key rule** box and the 4.10 error table — these cover about 80% of grammar items. 2) Do the 4.12 MCQs and 4.13 corrections without looking. 3) Revise the vocabulary tables in 10-minute bursts (read the word, cover the meaning).

4.1 Parts of speech — quick map

A word's part of speech is decided by the **job it does in the sentence**, not by the word itself. Ask what the word is doing — naming, replacing a noun, showing action, describing, linking — and then apply the rule for that part.

Part	Job	Examples	Exam point
Noun	Names a person, place, thing, idea	bank, Dhaka, honesty, information	Uncountable nouns (information, advice, news) take no "a" and no plural
Pronoun	Replaces a noun	he, it, who, each, themselves	Case after preposition: between you and **me** (not I)
Adjective	Describes a noun	secure, judicious, multifaceted	Order: opinion–size–age–shape–colour–origin–material–purpose (a nice big old round red Chinese wooden dining table)
Verb	Action or state	transfer, is, seem, have	Stative verbs (know, believe, own, contain) are not used in continuous tenses
Adverb	Modifies a verb, adjective or adverb	quickly, very, hardly, seldom	Linking verbs take an adjective: She looks **happy** (not happily)
Preposition	Relates a noun to another word	in, on, at, by, of, with	Fixed prepositions (4.5) are tested every year
Conjunction	Joins words or clauses	and, but, although, unless, either...or	Do not double: *Although* ... ~~but~~; *Because* ... ~~so~~
Interjection	Expresses feeling	Alas! Hurrah! Oh!	Used in narration (exclaimed with sorrow/joy)

Key rule — one word, many parts of speech

The part of speech depends on the **job in the sentence**, not the word. "**Round**" — The earth is round (adj) · a round of talks (noun) · round the figure (verb) · come round (adverb) · round the corner (preposition). In "sentence making" you must keep the part of speech given in the question.

Clauses (asked in MCQ)

Clause	Works as	Example
Noun clause	subject/object	I know **that he is honest**.
Adjective (relative) clause	describes a noun	The man **who came here yesterday** is my uncle.
Adverb clause	time, reason, condition, contrast	**When the bell rang**, we left.

Worked example — label every word

The new manager quickly approved the loan for them.
The → article (a determiner) · new → adjective (describes manager) · manager → noun (subject) · quickly → adverb (how he approved) · approved → verb · the → article · loan → noun (object) · for → preposition · them → pronoun in the **objective case**, because it follows a preposition (never ~~for they~~).

Past question Bank IT MCQ

"The man who came here yesterday..." — the underlined part is what kind of clause?
Answer: Adjective clause — it describes the noun "man" (introduced by the relative pronoun "who").

4.2 Tenses

Tense shows **when** an action happens (present, past, future) and **in what state** (indefinite, continuous, perfect, perfect continuous). In exams the answer is almost always fixed by a **signal word** or by the tense of the other clause — find that clue before you choose the verb form.

4.2.1 The 12 tenses with signal words

Tense	Form	Example	Signal words
Present indefinite	V1 / V1+s(es)	The bank opens at 10.	always, usually, often, every day, generally; universal truths
Present continuous	am/is/are + V-ing	She is writing a report now.	now, at present, at the moment, Look!, Listen!
Present perfect	has/have + V3	I have just finished.	just, already, yet, ever, never, recently, so far, since, for

Present perfect continuous	has/have been + V-ing	It has been raining since morning.	since, for (action still going on)
Past indefinite	V2	He joined in 2020.	yesterday, ago, last week, in 2020
Past continuous	was/were + V-ing	I was reading when he came.	while, when (background action)
Past perfect	had + V3	The train had left before we arrived.	before, after (the earlier of two past actions)
Past perfect continuous	had been + V-ing	He had been working for two hours when the power failed.	for/since + earlier past action
Future indefinite	shall/will + V1	We will finish tomorrow.	tomorrow, next, soon
Future continuous	shall/will be + V-ing	At 10 am tomorrow I will be sitting the exam.	at this time tomorrow
Future perfect	shall/will have + V3	By next month they will have completed it.	**by + future time**, by the time
Future perfect continuous	shall/will have been + V-ing	By June, she will have been working here for five years.	by ... for

Key rules that decide most tense items

- **Definite past time** (yesterday, ago, in 2020, last year) → **past indefinite**, never present perfect. ~~I have seen him yesterday~~ → I **saw** him yesterday.
- **since** + point of time (since 2020, since Monday); **for** + period (for three years). Main verb: present perfect (continuous). I **have known** him **since** 2015.
- "since" as a conjunction: main clause present perfect, since-clause past indefinite. It **has been** two years since he **left**.
- Two past actions: the earlier one → **past perfect**, the later → past indefinite. The patient **had died** before the doctor **came**.
- Time/condition clauses (when, before, after, until, as soon as, if, unless) take **present**, not future: I will call you when he **comes** (~~will come~~).
- **No sooner had** ... **than**; **Hardly/Scarcely had** ... **when/before** (inversion + past perfect).
- **It is (high/about) time** + subject + **past**: It is high time we **left**.
- Universal truth/habit stays present even after a past reporting verb: The teacher said that the earth **moves** round the sun.

Worked example — find the clue, then the tense

(i) I (live) in Dhaka since 2015. → Clue: *since* + point of time = started in the past and still going on ⇒ present perfect continuous ⇒ I **have been living** in Dhaka since 2015.
(ii) No sooner had he reached the station than the train (leave). → Fixed structure: *No sooner had* + V3 ... *than* + past indefinite ⇒ the train **left**.
(iii) He said that he (go) home. → Reporting verb in the past ⇒ the reported clause moves to a past form ⇒ he **would go** home.

Past questions AP 17.01.2026

B. By next month, the university (will have completed / will complete) the accreditation process. → **will have completed** (by + future time ⇒ future perfect).
C. Hardly (did the presentation begin / had the presentation begun) when the technical problem occurred. → **had the presentation begun** (Hardly + had + subject + V3 … when).

4.2.2 Sequence of tenses

Key rule

Principal clause in the **past** → subordinate clause also in a **past** form. Principal clause in present/future → any tense the sense needs.
He said that he **was** ill. · I knew that she **would** come. · He worked hard so that he **might** pass. · She **says** that she **will/was/is** … (any).

Exception	Example
Universal truth / habitual fact	Galileo proved that the earth **moves** round the sun.
Comparison with "than / as"	He liked you more than he **likes** me.
Purpose: present principal → may; past principal → might	We eat so that we **may** live. · He ran fast so that he **might** catch the bus.
"lest" → should	Walk carefully lest you **should** fall.

Traps

- "lest … should not" is wrong — lest already means "so that … not". ~~lest you should not fall~~.
- Stative verbs: ~~I am knowing him~~ → I know him. ~~She is having a car~~ → She has a car. (But "having lunch" = eating, fine.)
- "Since" with past indefinite in the main clause: ~~I knew him since 2010~~ → I have known him since 2010.

4.3 Subject–verb agreement — the 15 rules behind most errors

The verb must agree with its subject in **number and person**: a singular subject takes a singular verb (is, was, has, V1+s), a plural subject a plural verb. Most errors come from choosing the wrong subject, so first strip away every phrase between the subject and the verb, then decide.

#	Rule	Correct example
1	Words between subject and verb do not change the number (as well as, along with, together with, with, besides, in addition to, like, rather than)	The committee, as well as its sub-groups, **meets** regularly. · The manager, with his officers, **was** present.
2	Either…or / Neither…nor / not only…but also / or / nor → verb agrees with the **nearer** subject	Neither the manager nor the clerks **were** present. · Either the clerks or the manager **is** responsible.

3	Each, every, either, neither, everyone, anybody, nobody, someone → singular	Each of the students **has** a laptop. · Every boy and every girl **was** present.
4	Two subjects joined by "and" → plural; but one person/one idea → singular	Ram and Shyam **are** friends. · Bread and butter **is** my breakfast. · The secretary and treasurer **is** absent (one person).
5	"The" before each noun = two persons → plural	The secretary and the treasurer **are** absent.
6	Uncountable nouns → singular: information, advice, news, furniture, equipment, luggage, baggage, scenery, machinery, poetry, knowledge, evidence	The news **is** good. · The information **was** wrong. (~~informations~~, ~~furnitures~~, ~~sceneries~~)
7	Always plural: people, police, cattle, poultry, clergy, gentry, scissors, trousers, spectacles, goods, thanks, premises, proceeds	The police **have** arrested him. · Cattle **are** grazing.
8	Plural-looking but singular: news, mathematics, physics, economics, politics (as subject), measles, innings, the United States	Mathematics **is** my favourite subject.
9	Collective noun: acting as one unit → singular; members acting separately → plural	The jury **has** given its verdict. · The jury **were** divided in their opinions.
10	Amount of money, time, distance, weight as one sum → singular	Ten thousand taka **is** a big amount. · Five years **is** a long time.
11	"A number of" → plural; "The number of" → singular	A number of officers **were** transferred. · The number of accounts **is** rising.
12	"One of the + plural noun" → singular verb; but "one of the + plural + who/that" → plural (relative pronoun refers to the plural noun)	One of the boys **is** absent. · She is one of the scholars who **advocate** it.
13	"Many a" + singular noun + singular verb; "More than one" + singular	Many a man **has** tried. · More than one student **was** absent.
14	Relative pronoun takes the number and person of its antecedent	I, who **am** your friend, will help. · It is I who **am** to blame.
15	"There is/are" agrees with the noun that follows; titles of books/films → singular; "The + adjective" (the rich, the poor) → plural	There **are** many errors. · *Gitanjali* **is** famous. · The rich **are** not always happy.

Worked example — strip the sentence to subject + verb

The quality of the bank's services (have / has) improved, and neither the clerks nor the manager (was / were) late.

Step 1: remove the phrase *of the bank's services* → the subject is *quality* (singular) ⇒ **has**.

Step 2: *neither … nor* ⇒ the verb agrees with the nearer subject, *manager* (singular) ⇒ **was**.

Past questions AP 17.01.2026

D. The committee, as well as its sub-groups, (meets / meet) regularly. → **meets** (rule 1: verb agrees with "committee").
I. She is one of the scholars who (advocates / advocate) a critical pedagogy approach. → **advocate** (rule 12: "who" refers to "scholars").

Past question Bank IT MCQ

"Bread and butter ___ my favourite breakfast." → **is** (rule 4: one idea/dish ⇒ singular).

Pronoun agreement traps

- Everyone must do **his or her** (or **their**, accepted in modern English) duty — never "your".
- One must keep **one's** promise (not his).
- Each other = two people; one another = more than two (traditional rule, still tested).
- Between you and **me**; Let him and **me** go; He is taller than **I** (am).

4.4 Articles

Articles are determiners. **a/an** (indefinite) come before a singular countable noun mentioned for the first time or meaning "any one"; **the** (definite) points to something specific, already mentioned or unique. General plural or uncountable nouns and most proper nouns take **no article**.

Key rule — "a" or "an" goes by SOUND, not letter

an before a vowel sound: an hour, an honest man, an heir, an MBA, an M.P., an SSC candidate, an FIR, an X-ray, an LLB.
a before a consonant sound: a university, a unanimous decision, a European, a one-taka coin, a uniform, a useful book, a union, a U-turn.

Worked example — one sentence, four decisions

___ honest officer met ___ European tourist near ___ Padma Bridge; ___ tourist wanted ___ information.
An honest officer (h is silent → vowel sound) · **a** European (sounds like "yu" → consonant sound) · **the** Padma Bridge (a specific, famous structure) · **The** tourist (already mentioned) · **no article** before information (uncountable, used generally).

Past question AP 17.01.2026

G. The research team arrived at (a / an) unanimous conclusion. → **a** ("unanimous" begins with a "yoo" consonant sound).

Use "the"	Example	No article	Example

Something already mentioned or unique	the sun, the earth, the internet	Names of persons, cities, countries (most)	Dhaka, Bangladesh (but **the** USA, **the** UK, **the** Netherlands)
Rivers, seas, oceans, mountain ranges, deserts	the Padma, the Bay of Bengal, the Himalayas, the Sahara	Single mountains, lakes	Mount Everest, Lake Victoria
Superlatives and ordinals	the best, the first, the only	Languages, subjects, meals, games	Bangla, mathematics, lunch, cricket
Famous books, newspapers, ships, trains	the Gita, the Daily Star, the Titanic	Abstract/uncountable nouns in general sense	Honesty is the best policy.
Adjective used as a class noun	the rich, the poor, the old	Institutions used for their main purpose	go to school / bed / hospital / church (as student/patient)
Musical instruments, inventions, species	play the guitar; the computer has changed life	Days, months, festivals	on Monday, in January, at Eid
Comparative parallel	**The** more you read, **the** more you learn.	Diseases (most)	He has fever/diabetes (but **the** flu, **a** cold, **a** headache)

Article traps

- "He went to **the** school to meet the teacher" (visit, not study) vs "He goes to school" (as a student).
- "**A** few / **a** little" = some (positive); "few / little" = hardly any (negative); "**the** few" = the small number that exists (all of them). *The few books he had were old.*
- "Such **a** fool", "quite **a** long time", "half **an** hour", "many **a** man", "as tall **a** man as".
- No article: "at night", "by bus", "on foot", "in fact", "in time", "take place", "lose heart".

4.5 Prepositions

A preposition shows how a noun or pronoun relates to another word — in time, place, direction, or as a fixed partner of a verb or adjective. Time and place prepositions follow a logic (a point → **at**, a day or surface → **on**, an enclosed space or a period → **in**); fixed prepositions (appropriate prepositions) must be learnt as pairs.

4.5.1 Time and place

Preposition	Time	Place
at	clock time, festivals, night: at 10 am, at Eid, at night, at noon	a point/small place: at the gate, at Motijheel, at home
on	days and dates: on Monday, on 26 March, on my birthday	surface, street: on the table, on Mirpur Road

in	months, years, seasons, parts of day: in May, in 2026, in winter, in the morning	large area / inside: in Dhaka, in Bangladesh, in the room
since / for	since 2020 (point) · for six years (period)	—
by / until (till)	by Friday = not later than · until Friday = continuously up to	by = beside: by the river
between / among	—	between two · among three or more (between is also used for clearly separate items)
in / into, **on / onto**	in time = early enough · on time = punctual	in = position · into = movement (He jumped into the river)

4.5.2 Appropriate (fixed) prepositions — the high-frequency list

Phrase	Phrase	Phrase
abide **by** (a rule)	absorbed **in** (work)	abstain **from**
accede **to** (a request)	accompanied **by** (a person) / **with** (a thing)	according **to**
accused **of** (theft)	charged **with** (theft)	accustomed **to**
acquainted **with**	addicted **to**	adhere **to**
afraid **of**	agree **with** (a person) / **to** (a proposal)	aim **at**
angry **with** (a person) / **at** (a thing)	anxious **about** (worried) / **for** (eager)	apply **to** (a person) **for** (a post)
ashamed **of**	aware **of**	beware **of**
blind **to** (faults) / **in** (one eye)	boast **of**	capable **of**
comply **with**	composed **of**	confident **of**
congratulate **on**	consist **of**	deal **in** (goods) / **with** (a problem)
depend **on**	deprived **of**	die **of** (disease) / **from** (wound, overwork)
differ **from** (thing) / **with** (person, in opinion)	disgusted **with**	divide **into**
eligible **for**	entitled **to**	exception **to**
familiar **with** (a thing) / **to** (a person)	fond **of**	full **of**
good **at**	guilty **of**	indifferent **to**
insist **on**	interested **in**	jealous **of**
junior/senior/superior/inferior/prior **to**	prefer A **to** B	preferable **to**
married **to** (not with)	obedient **to**	object **to**

open **to**	prevent/prohibit/refrain **from**	proud **of** = take pride **in**
result **in** (consequence) / **from** (cause)	rely **on**	respond **to**
satisfied **with**	similar **to**	suffer **from**
sure **of**	sympathy **for** / sympathise **with**	tired **of** (bored) / **from** (exhausted)
translate **into**	wait **for** (a person) / **on** (serve)	with a view **to** + V-ing
look forward **to** + V-ing	averse **to**	conducive **to**

Worked example — reason out each blank

The meeting is ___ Monday ___ 10 am ___ the board room. He is good ___ maths but weak ___ English, and he has been absent ___ office ___ three days.
on Monday (a day) · **at** 10 am (clock time) · **in** the board room (enclosed space) · good **at** (fixed) · weak **in** (fixed) · absent **from** (fixed) · **for** three days (a length of time; *since* only with a starting point).

Past question AP 17.01.2026

H. Any breach of conduct could result (in / to) suspension. → **in** (result in = lead to a consequence; result from = arise from a cause).

Past question Bank IT MCQ

"___ opportunity comes responsibility." → **With** (with X comes Y = X brings Y; inverted sentence).

Key rule — "to" + V-ing

In these phrases "to" is a **preposition**, so a gerund follows: look forward to **meeting**, with a view to **opening**, be used/accustomed to **working**, object to **being**, confess to **stealing**, prefer reading **to** watching.
No preposition after: discuss (~~about~~), enter (~~into~~ a room), reach (~~at~~), resemble (~~with~~), order (~~for~~), attack (~~on~~), comprise (~~of~~), emphasise (~~on~~), request (~~for~~).

4.6 Voice change

In the active voice the subject **does** the action; in the passive voice the receiver of the action becomes the subject. Use the passive when the doer is unknown or unimportant (The vault was opened at 9 am). Only **transitive** verbs — verbs with an object — can be changed.

Active: Subject + Verb + Object → Passive: Object + be (in the same tense) + V3 + by + Subject

Tense / form	Active	Passive
Present indefinite	He writes a letter.	A letter **is written** by him.
Present continuous	He is writing a letter.	A letter **is being written** by him.

Present perfect	He has written a letter.	A letter **has been written** by him.
Past indefinite	He wrote a letter.	A letter **was written** by him.
Past continuous	He was writing a letter.	A letter **was being written** by him.
Past perfect	He had written a letter.	A letter **had been written** by him.
Future indefinite	He will write a letter.	A letter **will be written** by him.
Future perfect	He will have written a letter.	A letter **will have been written** by him.
Modal (can, may, must, should, ought to)	You must obey the rules.	The rules **must be obeyed** by you.
Modal perfect	They should have done it.	It **should have been done** by them.
Two objects	The bank gave him a loan.	**He was given** a loan by the bank. / A loan was given to him by the bank.
Interrogative (yes/no)	Did he write the letter?	**Was** the letter **written** by him?
Interrogative (wh-)	Who wrote the letter?	**By whom was** the letter written?
Wh- with object	What did he say?	What **was said** by him?
Imperative	Open the door.	**Let** the door **be opened**.
Imperative (request)	Please help me.	You are requested to help me.
Imperative (negative)	Do not insult the poor.	Let the poor **not be** insulted. / The poor should not be insulted.
Imperative, indirect object	Pluck me a flower.	Let a flower **be plucked for me**.
Let + object	Let him do the work.	Let the work **be done** by him.
Verbs with fixed preposition	Everybody laughed at him.	He **was laughed at** by everybody.
Not "by"	The news surprised me. · Milk contains fat.	I was surprised **at** the news. · Fat is contained **in** milk. (known to, pleased with, interested in, filled with)
"It is said" type	People say that he is honest.	**It is said** that he is honest. / He **is said to be** honest.
Infinitive	I have to do it.	It **has to be done** by me.

Worked example — three steps

(i) Who taught you English? → Step 1: *who* as subject becomes *by whom*. Step 2: the object *you* becomes the subject. Step 3: past indefinite ⇒ was/were + V3 ⇒ **By whom were you taught English?**

(ii) The bank will give him a loan. → Two objects; the personal object usually becomes the subject; future indefinite ⇒ will be + V3 ⇒ **He will be given a loan by the bank.**

Past question Bank IT MCQ

Passive of "Pluck me a flower." → **Let a flower be plucked for me.** (Imperative ⇒ Let + object + be + V3; "me" becomes "for me".)

Voice traps

- Intransitive verbs (die, sleep, arrive, happen, seem) have **no** passive. ~~An accident was happened~~ → An accident happened.
- Pronoun case changes: I→me, we→us, he→him, they→them, who→by whom.
- Do not change the tense. "has written" → "has **been** written" (not "was written").
- "by people / by someone / by them" (vague agent) is usually dropped: English **is spoken** all over the world.

4.7 Narration (direct and indirect speech)

Direct speech quotes the speaker's exact words; indirect (reported) speech gives the same meaning in the reporter's words. Every item tests four changes — **reporting verb and linker, pronoun, tense, time/place words** — so apply them in that order and you will not miss one.

Key rules (reporting verb in the past)

1. Remove commas and inverted commas; join with a linker (that, if/whether, wh-word, to + verb).
2. Change pronouns by sense: 1st person → as the subject of the reporting verb; 2nd → as the object; 3rd → no change.
3. Back-shift the tense: am/is → was; are → were; do/does → did; V2 → had + V3; has/have → had; will/shall → would; can → could; may → might; must → had to (obligation).
4. Change words of nearness: now → then; today → that day; tonight → that night; yesterday → the previous day; tomorrow → the next day; ago → before; this → that; these → those; here → there; last night → the previous night; next week → the following week.
5. If the reporting verb is present/future (says, will say) → **no** tense change. Universal truths → no tense change.

Type	Reporting verb + linker	Direct	Indirect
Assertive	said/told + that	He said to me, "I am busy now."	He told me that he **was** busy **then**.
Assertive (past)	said that + had V3	She said, "I saw him yesterday."	She said that she **had seen** him **the previous day**.
Yes/no question	asked + if/whether	He said to me, "Are you ill?"	He asked me **if I was** ill.
Wh- question	asked + wh-word (statement order)	He said to me, "Where do you live?"	He asked me **where I lived**.

Command	ordered/told + to	The officer said to the guard, "Shut the gate."	The officer **ordered** the guard **to shut** the gate.
Request	requested + to	She said to me, "Please help me."	She **requested** me **to help** her.
Negative command	told/forbade + not to	He said to me, "Don't go there."	He told me **not to go** there. / He **forbade** me to go there.
Advice	advised + to	The doctor said, "You should take rest."	The doctor **advised** him to take rest.
Let's (proposal)	proposed/suggested + that … should	He said to us, "Let's go out."	He **proposed** to us **that we should** go out.
Let (permission)	told + that … might be allowed / asked to let	He said, "Let me go."	He **wished that he might be allowed** to go.
Exclamatory	exclaimed with joy/sorrow/wonder + that	He said, "Alas! I am undone."	He **exclaimed with sorrow** that he was undone.
Exclamatory (What/How)	exclaimed that … very/great	She said, "What a beautiful bird it is!"	She **exclaimed** that it was **a very beautiful** bird.
Optative (wish)	wished/prayed + that … might	Mother said to me, "May you be happy."	Mother **prayed that I might** be happy.
Greeting	wished/bade	He said to me, "Good morning."	He **wished** me good morning.
Thanks / yes / no	thanked / replied in the affirmative	He said, "Yes, I will go."	He **replied in the affirmative** and said that he would go.

Worked example — assertive, interrogative, imperative

(i) He said to me, "I am going to the bank today." → said to ⇒ *told*, linker *that*; I ⇒ he; am going ⇒ was going; today ⇒ that day ⇒ **He told me that he was going to the bank that day.**
(ii) She said to him, "Have you finished the report?" → yes/no question ⇒ *asked … if/whether*, statement word order; you ⇒ he; have finished ⇒ had finished ⇒ **She asked him if he had finished the report.**
(iii) The manager said to the peon, "Bring me a file." → order ⇒ *ordered … to* + V1; me ⇒ him ⇒ **The manager ordered the peon to bring him a file.**

Narration traps

- Indirect question has **statement word order** and no question mark: ~~He asked me where did I live?~~
- "said to" → told/asked/ordered; never "said me".
- "must" for a permanent truth/duty stays "must": He said that all men must die.
- Already-past forms (had V3, could, would, should, might, ought to) do not change further.

4.8 Conditionals, wishes and the subjunctive

A conditional sentence has an if-clause (the condition) and a main clause (the result). The tense pair shows how real the condition is: zero = always true, first = possible in the future, second = unreal now, third = unreal in the past. Identify the type from the clause you are given; the other clause then follows automatically.

Type	If-clause	Main clause	Example
Zero (fact)	present	present	If you heat ice, it melts.
First (likely)	present (not will)	will/can/may + V1	If it rains, we **will** stay home.
Second (unreal now)	past (were for all persons)	would/could/might + V1	If I **were** you, I **would** accept the offer.
Third (unreal past)	had + V3	would/could/might **have** + V3	If the department **had allocated** more funds, the project **would have succeeded**.
Inverted (formal)	Had / Were / Should + subject	as above	**Had I known**, I would have helped. · **Were I** rich … · **Should you** need help, call me.
Mixed	had + V3 (past)	would + V1 (now)	If he had studied, he **would be** an officer now.

Worked example — work from the given clause

(i) If I (be) the Governor, I would cut the policy rate. → main clause *would* + V1 ⇒ second conditional ⇒ if-clause in the past, and *be* becomes *were* for every person ⇒ **If I were** the Governor …
(ii) Had he applied in time, he (get) the job. → *Had* + subject + V3 = third conditional with inversion ⇒ **he would have got** the job.
(iii) I wish I (know) the answer yesterday. → a wish about the past ⇒ past perfect ⇒ I wish I **had known** the answer.

Past questions AP 17.01.2026

A. If the department had allocated more funds, the project (would succeed / would have succeeded). → **would have succeeded** (third conditional).
J. The researcher insisted that the data (be / is) analyzed before publication. → **be** (insist that ⇒ subjunctive base form).
E. He had better (leave / left) the station before it's too late. → **leave** (had better + V1).

Key rule — unreal past forms

Structure	Form after it	Example
I wish (present wish)	past / were	I wish I **were** a bird. · I wish I **knew** the answer.
I wish (past regret)	had + V3	I wish I **had studied** harder.
I wish (future/annoyance)	would + V1	I wish he **would** stop talking.
as if / as though (unreal)	past / were; had + V3 for earlier time	He talks as if he **were** the boss. · He looked as if he **had seen** a ghost.
It is (high/about) time	past	It is time we **started**. (or: It is time **to start**.)
would rather + another subject	past	I would rather you **went** now.
would rather / had better (same subject)	V1	I would rather **stay**. · You had better **go**.
insist, suggest, recommend, demand, propose, order, request, it is essential/necessary/important that	(should) + V1 (subjunctive)	The manager suggested that he **submit** the report. · It is essential that every officer **be** present.
unless (= if not)	positive verb	Unless you work hard, you will fail. (~~Unless you do not work~~)
lest	should + V1	Read carefully lest you **should** make mistakes.

Conditional traps

- ~~If I will see him~~ → If I **see** him, I will tell him.
- ~~If he would have come~~ → If he **had come** (never "would" in the if-clause).
- ~~If I was you~~ → If I **were** you (formal/exam English).
- "Provided (that)", "in case", "as long as", "on condition that" behave like "if" — present tense for future meaning.

4.9 Degrees of comparison and sentence transformation

Transformation changes the **form** of a sentence — degree, affirmative ↔ negative, simple ↔ complex ↔ compound, voice, narration — while the **meaning stays exactly the same**. After every transformation, check your answer by asking whether it still says the same thing, no more and no less.

4.9.1 Degrees of comparison

Rule	Example

Positive: as + adj + as (affirmative); not so/as + adj + as (negative)	She is **as** tall **as** her sister. · He is **not so** clever **as** you.
Comparative + than; "than any other + singular"	Dhaka is bigger **than any other city** in Bangladesh.
Superlative: the + adj-est / most; "of all", "in the group"	Dhaka is **the biggest** city in Bangladesh.
Latin comparatives take **to**: senior, junior, superior, inferior, prior, prefer, preferable	He is senior **to** me. (~~than~~) · I prefer tea **to** coffee.
No double comparison	~~more better~~ → better · ~~most cleverest~~ → cleverest
Absolute adjectives have no comparison: unique, perfect, ideal, complete, round, square, excellent, supreme, extreme	~~most unique~~ → unique
Compare like with like	The climate of Dhaka is hotter than **that of** Sylhet. (~~than Sylhet~~)
Two things → comparative, not superlative	He is the **taller** of the two brothers.
elder/eldest (family, not with than) · older/oldest (age, with than)	my **elder** brother · He is **older** than me.
farther (distance) · further (additional)	further information
later/latest (time) · latter/last (order)	the latest news · the latter of the two

Example — one fact in three degrees

Superlative: Shakib is **the best** all-rounder in the team.
Comparative: Shakib is **better than any other** all-rounder in the team.
Positive: **No other** all-rounder in the team is **as good as** Shakib.
For "one of the best": Rahim is one of the best officers. → Rahim is better than **most other** officers.
→ **Very few** officers are as good as Rahim.

4.9.2 Transformation of sentences (meaning unchanged)

Change	Original	Transformed
Affirmative → negative	Only Rahim passed.	**None but** Rahim passed.
Affirmative → negative	He is always punctual.	He is **never late**.
Affirmative → negative	As soon as he came, we left.	**No sooner had** he come **than** we left.
Affirmative → negative	Everyone loves his country.	**There is no one who** does not love his country.
Assertive → interrogative	Nobody trusts a liar.	**Who** trusts a liar?
Assertive → interrogative	It is useless to cry over spilt milk.	**What is the use of** crying over spilt milk?

Exclamatory → assertive	What a lovely day!	It is a very lovely day.
Exclamatory → assertive	Would that I were young again!	I wish I were young again.
Simple → complex	I know his address.	I know **where he lives**.
Simple → complex	He is too weak to walk.	He is **so** weak **that he cannot** walk.
Simple → compound	Being ill, he could not come.	He was ill, **and so** he could not come.
Complex → simple	Though he is poor, he is honest.	**In spite of** his poverty / **Despite being** poor, he is honest.
Compound → complex	Work hard, or you will fail.	**Unless** you work hard, you will fail. / **If** you do not work hard, ...
Complex → compound	Though he tried, he failed.	He tried **but** failed.

Key rule — too ... to / so ... that

"too + adj + to + V1" already carries a negative meaning. ~~He is too weak that he cannot walk~~; ~~too weak not to walk~~. Use "so ... that ... cannot". Also: "so ... that" (result), "such a ... that" (with a noun): It was **such a hot** day **that** we stayed in.

4.9.3 Question tags (asked in MCQ)

Rule	Example
Positive statement → negative tag; negative → positive	He is busy, **isn't he**? · She can't swim, **can she**?
Semi-negatives (hardly, scarcely, seldom, rarely, barely, few, little, never, nobody) → positive tag	He hardly ever comes, **does he**?
Let's → shall we; Let me/him (permission) → will you	Let's go, **shall we**? · Let me go, **will you**?
Imperative → will/won't/would you	Shut the door, **will you**?
I am → aren't I	I am late, **aren't I**?
Everyone/somebody/nobody → they; nothing/everything → it	Everybody came, **didn't they**? · Nothing happened, **did it**?
There is → isn't there; had better → hadn't	You had better go, **hadn't you**?

Past questions Bank IT MCQ

"Let's go, ___?" → **shall we**.
"He hardly ever comes, ___?" → **does he** ("hardly" is negative, so the tag is positive).

4.10 Error detection and correction — 40 typical bank-exam errors

Method: (1) find the subject and its verb — check agreement and tense; (2) check pronouns, articles and prepositions; (3) check fixed structures (no sooner...than, too...to, lest, unless); (4) check word choice and redundancy.

#	Incorrect	Correct	Rule
1	He gave me many informations.	He gave me **a lot of information**.	Uncountable noun
2	The furnitures of this office are new.	The **furniture** of this office **is** new.	Uncountable, singular
3	Each of the officers have a laptop.	Each of the officers **has** a laptop.	Each → singular
4	Neither he nor his friends was present.	... nor his friends **were** present.	Nearer subject
5	The manager, along with his staff, were present.	... **was** present.	"along with" ignored
6	I have seen him yesterday.	I **saw** him yesterday.	Definite past time
7	I am living here since 2020.	I **have been living** here since 2020.	since → perfect continuous
8	I will wait till he will come.	... till he **comes**.	No future in time clause
9	No sooner had he left when the phone rang.	... **than** the phone rang.	No sooner ... than
10	Scarcely he had reached when it rained.	Scarcely **had he** reached when it rained.	Inversion
11	It is high time we leave.	It is high time we **left**.	High time + past
12	If I was you, I would resign.	If I **were** you ...	Unreal condition
13	If he would have studied, he would have passed.	If he **had studied** ...	Third conditional
14	Unless you do not hurry, you will miss it.	Unless you hurry ...	unless = if not
15	Walk carefully lest you should not fall.	... lest you **should fall**.	lest is already negative
16	He is senior than me.	He is senior **to** me.	Latin comparative
17	I prefer tea than coffee.	I prefer tea **to** coffee.	prefer ... to
18	This is the most unique design.	This is a **unique** design.	Absolute adjective
19	He is more cleverer than his brother.	He is **cleverer** than ...	Double comparative

20	Dhaka is bigger than any city in Bangladesh.	… than any **other** city …	Comparison within a group
21	The population of Dhaka is larger than Khulna.	… larger than **that of** Khulna.	Compare like with like
22	He is an university teacher.	He is **a** university teacher.	Sound "yoo"
23	She is a honest officer.	She is **an** honest officer.	Silent h
24	He is married with a doctor.	He is married **to** a doctor.	Fixed preposition
25	We discussed about the budget.	We **discussed** the budget.	No preposition
26	He reached at the office late.	He **reached** the office late.	No preposition
27	The report comprises of five chapters.	… **comprises** / **consists of** five chapters.	comprise has no "of"
28	I look forward to meet you.	… to **meeting** you.	to (preposition) + gerund
29	He prevented me to go.	He prevented me **from going**.	prevent from + V-ing
30	Although he is rich, but he is unhappy.	Although he is rich, he is unhappy.	No double conjunction
31	He is too weak that he cannot walk.	He is **so** weak that he cannot walk. / **too weak to walk**.	too … to / so … that
32	One should do his duty.	One should do **one's** duty.	Pronoun agreement
33	Between you and I, he is wrong.	Between you and **me** …	Object case after preposition
34	The police has arrested the thief.	The police **have** arrested …	police → plural
35	He returned back from Chattogram.	He **returned** from Chattogram.	Redundancy (also: repeat again, revert back, cousin brother, the reason is because)
36	She suggested that he submits the form today.	… that he **(should) submit** …	Subjunctive
37	He has got two brother-in-laws.	… two **brothers-in-law**.	Plural of compound noun: main word
38	She looks beautifully today.	She looks **beautiful** today.	Linking verb + adjective
39	Hardly I had finished when he came.	Hardly **had I** finished …	Inversion after negative adverb
40	He did not know to swim.	He did not know **how to** swim.	know how to

Writing the answer in the written exam

Write the full corrected sentence, underline the corrected part, and add the rule in a few words (e.g. "has — each takes a singular verb"). Half-corrected sentences lose marks.

Linking words (connectors)

Worked example — apply the four-step method

Each of the officers have submitted their report yesterday.
Step 1 (subject–verb): the subject is *Each* (singular), not *officers* ⇒ *has*; but *yesterday* is a finished past time, so the present perfect is wrong ⇒ **submitted**.
Step 2 (pronoun): *Each* is singular ⇒ **his or her** report.
Correct: **Each of the officers submitted his or her report yesterday.**

Past question AP 17.01.2026

F. The methodology section is comprehensive; (for example / however), the discussion lacks critical depth. → **however** (the second clause contrasts with the first ⇒ contrast connector; "for example" introduces an illustration).

Connector	Meaning	Example
however	contrast	The app is fast; **however**, it is not secure.
therefore	result	The server failed; **therefore**, transactions stopped.
moreover	addition	The plan is cheap; **moreover**, it is easy to run.
for example	illustration	MFS is popular; **for example**, bKash has millions of users.
otherwise	if not	Change your PIN; **otherwise**, your account may be hacked.
although / though	contrast + clause	**Although** he is rich, he is unhappy. (no "but")
despite / in spite of	contrast + noun / V-ing	**Despite** the rain (~~despite of~~), we went out.
whereas	direct comparison	RAM is volatile, **whereas** ROM is not.
unless	if not	**Unless** you verify the OTP, the transfer will fail.
as long as	on condition that	You may stay **as long as** you keep quiet.

4.11 Vocabulary

4.11.1 Synonyms and antonyms (50 words)

Word	Synonym	Antonym	Word	Synonym	Antonym
Abandon	desert, give up	keep, retain	Accelerate	speed up	slow down, decelerate
Accurate	exact, precise	inaccurate, wrong	Adequate	sufficient	insufficient
Affluent	rich, wealthy	poor, needy	Ambiguous	unclear, vague	clear, explicit

Amicable	friendly	hostile	Augment	increase	decrease, diminish
Authentic	genuine	fake, spurious	Benevolent	kind, generous	malevolent, cruel
Candid	frank, open	secretive	Cautious	careful	rash, careless
Comprehensive	complete, thorough	partial, limited	Condone	overlook, pardon	condemn, punish
Conspicuous	noticeable	inconspicuous, hidden	Credible	believable	incredible, doubtful
Diligent	hard-working	lazy, idle	Eminent	famous, distinguished	obscure, unknown
Enormous	huge, vast	tiny, small	Ephemeral	short-lived, transient	permanent, lasting
Fabricate	invent, falsify	(tell the) truth, verify	Frugal	thrifty, economical	extravagant
Genuine	real	counterfeit	Gregarious	sociable	unsociable, reserved
Hostile	unfriendly	friendly, amicable	Immense	huge	tiny
Impartial	neutral, fair	biased, partial	Inevitable	unavoidable	avoidable
Judicious	wise, prudent	foolish, injudicious	Lucid	clear	obscure, confusing
Meagre	scanty	abundant, plentiful	Modest	humble	arrogant, proud
Negligent	careless	careful, diligent	Obsolete	outdated	modern, current
Obstinate	stubborn	flexible, docile	Optimistic	hopeful	pessimistic
Prudent	wise, careful	imprudent, rash	Reluctant	unwilling	willing, eager
Robust	strong, sturdy	weak, fragile	Scarce	rare, insufficient	plentiful, abundant
Segregate	separate, isolate	combine, integrate	Spurious	false, fake	genuine
Tranquil	calm, peaceful	turbulent, noisy	Transparent	clear, open	opaque, secretive
Trivial	unimportant	important, significant	Vague	unclear	clear, definite
Verbose	wordy	concise, brief	Vulnerable	exposed, weak	protected, secure
Zeal	enthusiasm	apathy, indifference	Lenient	mild, tolerant	strict, severe

Past question Bank IT MCQ

Antonym of "segregate" → **combine** (segregate = separate).

Sentence making — words given AP 17.01.2026

Judicious (adj), Condone (v), Fabricate (v), Accentuate (v), Multifaceted (adj) — e.g. "The bank will not **condone** any breach of its information security policy." Keep the given part of speech. Full set of model sentences: Chapter 5.

4.11.2 Idioms and phrases (44)

Idiom	Meaning	Idiom	Meaning
A bolt from the blue	a sudden shock	At a snail's pace	very slowly
At daggers drawn	bitterly hostile	At one's wits' end	completely puzzled
Bad blood	enmity	Beat about the bush	avoid the main point
Bear the brunt	suffer the main force	Break the ice	start a conversation
Burn the midnight oil	study/work late at night	By hook or by crook	by any means
Call a spade a spade	speak frankly	Cry over spilt milk	regret what cannot be undone
Cut a sorry figure	make a poor impression	Easier said than done	harder to do than to say
A far cry	very different / a long way	Fish in troubled waters	gain from a confused situation
Get into hot water	get into trouble	Give up the ghost	die
A hard nut to crack	a difficult problem/person	Hit the nail on the head	say exactly the right thing
In black and white	in writing	In a nutshell	briefly
In the long run	eventually	Keep one's fingers crossed	hope for success
Leave no stone unturned	try every possible way	Let the cat out of the bag	reveal a secret
Make both ends meet	live within one's income	Nip in the bud	stop at an early stage
Null and void	having no legal force	Once in a blue moon	very rarely
Out of the question	impossible	Red-letter day	a memorable day
Red tape	official delay / bureaucracy	Rule of thumb	a practical rough rule
A white elephant	costly but useless possession	The lion's share	the largest part
Under the weather	slightly ill	Up to the mark	of the expected standard
A wild goose chase	a useless search	Apple of one's eye	very dear
Above board	honest, open	Bring to book	punish / make accountable

Through thick and thin	in all circumstances	Turn a deaf ear	ignore

4.11.3 Phrasal verbs (24)

Phrasal verb	Meaning	Phrasal verb	Meaning
bring about	cause	bring up	raise (a child); mention
call off	cancel	call on	visit; ask formally
carry out	perform, execute	come across	meet/find by chance
give in	surrender, yield	give up	stop, abandon
go through	examine; suffer	look after	take care of
look into	investigate	look up	search (in a dictionary); improve
look down on	despise	make out	understand
put off	postpone	put up with	tolerate
run out of	use up completely	set up	establish
take after	resemble (a parent)	take over	assume control
turn down	reject	turn up	appear, arrive
break down	stop working; collapse	break into	enter by force

4.11.4 One-word substitution (26)

Description	Word	Description	Word
One who knows everything	omniscient	One who is present everywhere	omnipresent
All-powerful	omnipotent	Fit to be eaten	edible
That cannot be read	illegible	That cannot be corrected	incorrigible
That cannot be avoided	inevitable	That cannot be seen	invisible
A government by the people	democracy	Rule by a few	oligarchy
Government by officials	bureaucracy	Rule by one person with total power	autocracy
One who does not believe in God	atheist	One who loves mankind	philanthropist
One who hates mankind	misanthrope	A person who lends money at very high interest	usurer
One who cannot pay debts	insolvent / bankrupt	A list of items for discussion at a meeting	agenda
Life history written by oneself	autobiography	Written by an unknown author	anonymous
Speech made without preparation	extempore	A place where money is coined	mint
Study of the population	demography	Medicine that kills germs	antiseptic

One who is new to a job	novice	Words inscribed on a tomb	epitaph

4.11.5 Commonly misspelt words

Correct	Correct	Correct	Correct
accommodation	committee	necessary	separate
achievement	commitment	occasion	successful
acknowledgement	conscience	occurrence	surprise
address	definitely	embarrass	receive
argument	disciplinary	millennium	recommend
beginning	entrepreneur	miscellaneous	privilege
bureaucracy	government	parliament	questionnaire
business	guarantee	maintenance	unnecessary
calendar	jewellery (UK) / jewelry (US)	absorption	withhold

Past questions Bank IT MCQ

Misspelled: Commitment / Disciplinary / Jewelery / Absorption → **Jewelery** (correct: jewellery / jewelry).
Correct spelling → **Committee** (double m, double t, double e).

Spelling shortcuts

"i before e except after c": receive, ceiling, deceive (but: seize, weird, foreign). · Double the final consonant when the stress is on the last syllable: begin → beginning, occur → occurred, commit → committed; but benefit → benefited, offer → offered. · Drop the silent e before -ing/-able: write → writing, but agree → agreeing, notice → noticeable.

4.11.6 Confusing pairs

Pair	Difference and example
accept / except	accept = receive; except = excluding. All **except** him **accepted** the offer.
advice / advise	advice (noun) · advise (verb). I **advise** you to take his **advice**.
affect / effect	affect (verb) = influence · effect (noun) = result. Inflation **affects** prices; its **effect** is severe.
beside / besides	beside = next to · besides = in addition to
principal / principle	principal = head; main; capital sum · principle = rule. The **principal** amount; a man of **principle**.
stationary / stationery	stationary = not moving · stationery = paper, pens
complement / compliment	complement = complete · compliment = praise

loose / lose	loose = not tight · lose = fail to keep
economic / economical	economic = related to the economy · economical = thrifty, not wasteful
historic / historical	historic = famous, important · historical = about history
continual / continuous	continual = repeated with breaks · continuous = without a break
lie / lay	lie (lay, lain) = rest · lay (laid, laid) = put down. He **laid** the file on the desk and **lay** down.
rise / raise	rise (intransitive): Prices rise · raise (transitive): raise the rate
its / it's	its = possessive · it's = it is
fewer / less	fewer + countable (fewer errors) · less + uncountable (less money)
imply / infer	speaker implies · listener infers
eligible / illegible	eligible = qualified · illegible = not readable
council / counsel	council = body of people · counsel = advice; lawyer
ensure / insure	ensure = make certain · insure = protect by insurance
personal / personnel	personal = private · personnel = staff

4.12 Practice MCQ

1. The committee ___ decided to postpone the meeting.

(a) have (b) has
(c) are (d) were

Answer: (b) — Acting as one unit ⇒ singular

2. Neither the clerk nor the officers ___ responsible.

(a) is (b) was
(c) are (d) has been

Answer: (c) — Verb agrees with the nearer subject (officers)

3. I have been working here ___ 2019.

(a) for (b) from
(c) since (d) by

Answer: (c) — since + point of time

4. By the time we reached, the train ___.

(a) left (b) has left
(c) had left (d) was leaving

Answer: (c) — Earlier of two past actions ⇒ past perfect

5. No sooner had I opened the app ___ it crashed.

(a) when
(b) than
(c) then
(d) before

Answer: (b) — No sooner ... than

6. It is high time the bank ___ its security policy.

(a) updates
(b) update
(c) updated
(d) will update

Answer: (c) — It is high time + past

7. If I ___ the manager, I would approve the loan.

(a) am
(b) was
(c) were
(d) had been

Answer: (c) — Second conditional ⇒ were

8. Had he applied earlier, he ___ the job.

(a) would get
(b) will get
(c) would have got
(d) got

Answer: (c) — Inverted third conditional

9. The manager recommended that every account ___ verified.

(a) is
(b) be
(c) was
(d) will be

Answer: (b) — recommend that ⇒ subjunctive

10. He holds ___ MBA from ___ university in Dhaka.

(a) a, an
(b) an, a
(c) an, an
(d) a, a

Answer: (b) — "MBA" starts with the vowel sound "em"; "university" with the consonant sound "yoo"

11. He is ___ European.

(a) a
(b) an
(c) the
(d) no article

Answer: (a) — European begins with a 'yoo' sound

12. He is accused ___ fraud.

(a) for
(b) with
(c) of
(d) on

Answer: (c) — accused of / charged with

13. I prefer working online ___ visiting a branch.

(a) than
(b) to
(c) from
(d) over than

Answer: (b) — prefer A to B

14. All employees must abide ___ the code of conduct.

(a) with
(b) by
(c) to
(d) on

Answer: (b) — abide by

15. Passive of "Who broke the server?"

(a) Who was broken the server?
(b) By whom was the server broken?
(c) By whom the server was broken?
(d) Whom was the server broken by him?

Answer: (b) — By whom + was + object + V3

16. Passive of "Do not touch the cable."

(a) The cable is not touched.
(b) Let the cable not be touched.
(c) Let not touch the cable.
(d) The cable was not touched.

Answer: (b) — Imperative ⇒ Let + object + (not) be + V3

17. He said to me, "Where are you going?" → Indirect:

(a) He asked me where was I going.
(b) He asked me where I was going.
(c) He told me where I am going.
(d) He asked me that where I was going.

Answer: (b) — Statement word order, tense back-shifted

18. She said, "I will finish it tomorrow." → Indirect:

(a) She said that she will finish it tomorrow.
(b) She said that she would finish it the next day.
(c) She said that she would finish it tomorrow.
(d) She told that she would finish it next day.

Answer: (b) — will → would; tomorrow → the next day

19. Choose the correct sentence.

(a) He gave me an advice.
(b) He gave me many advices.
(c) He gave me a piece of advice.
(d) He gave me advices.

Answer: (c) — advice is uncountable

20. Choose the correctly spelt word.

(a) Accomodation
(b) Accommodation
(c) Acommodation
(d) Accommodasion

Answer: (b) — double c, double m

21. Synonym of "judicious":

(a) hasty
(b) wise
(c) biased
(d) greedy

Answer: (b) — judicious = showing good judgement

22. Antonym of "ephemeral":

(a) transient
(b) brief
(c) permanent
(d) fragile

Answer: (c) — ephemeral = short-lived

23. "To burn the midnight oil" means:

(a) to waste money (b) to work late at night
(c) to cause a fire (d) to be angry

Answer: (b) — Idiom

24. "Put off" means:

(a) tolerate (b) postpone
(c) extinguish (d) reject

Answer: (b) — put off = postpone (put out = extinguish)

25. A person who cannot pay his debts:

(a) insolvent (b) solvent
(c) debtor (d) creditor

Answer: (a) — insolvent / bankrupt

26. Walk carefully lest you __ slip.

(a) will (b) should
(c) would not (d) should not

Answer: (b) — lest ... should (no 'not')

27. She is one of the officers who __ promoted this year.

(a) has been (b) have been
(c) was (d) is

Answer: (b) — who refers to 'officers' (plural)

28. Dhaka is more populous than __ city in Bangladesh.

(a) any (b) any other
(c) all (d) all other

Answer: (b) — Comparative within the same group ⇒ any other

29. You had better __ the password at once.

(a) change (b) changed
(c) to change (d) changing

Answer: (a) — had better + V1

30. The new software has __ fewer bugs than the old one.

(a) much (b) far
(c) more (d) most

Answer: (b) — far/many + fewer (countable); 'much fewer' is wrong

4.13 Correct the sentences (written style)

Write the corrected sentence in full and name the rule — the way the written paper is marked.

#	Sentence	Correct sentence	Rule
1	The datas shows a rise in fraud.	The **data show** (or: The data shows) a rise in fraud.	"data" has no -s plural; plural verb in formal use, singular accepted
2	Each of the branches have its own server.	Each of the branches **has** its own server.	Each → singular
3	The number of mobile users are increasing.	The number of mobile users **is** increasing.	The number of → singular
4	I am working in this bank for five years.	I **have been working** in this bank for five years.	for + period, action continuing ⇒ present perfect continuous
5	He did not came to office yesterday.	He did not **come** to the office yesterday.	did + V1
6	If it will rain, the meeting will be cancelled.	If it **rains**, the meeting will be cancelled.	First conditional: present in if-clause
7	I wish I am a software engineer.	I wish I **were** a software engineer.	wish + were (unreal present)
8	He behaves as if he is the owner of the bank.	He behaves as if he **were** the owner of the bank.	as if + were (unreal)
9	She is good in programming.	She is good **at** programming.	good at
10	The customer requested for a new card.	The customer **requested** a new card. / made a request **for** a new card.	request (verb) takes no "for"
11	He told that he was busy.	He **said** that he was busy. / He **told me** that he was busy.	told needs a personal object
12	He asked me what was my name.	He asked me what **my name was**.	Indirect question: statement order
13	Though he worked hard, but he could not pass.	Though he worked hard, he could not pass.	No double conjunction
14	This is the best of the two plans.	This is the **better** of the two plans.	Two items ⇒ comparative
15	Mathematics are my favourite subject.	Mathematics **is** my favourite subject.	Subject names in -ics → singular
16	The cattle is grazing in the field.	The cattle **are** grazing in the field.	cattle → always plural
17	He has been absent since three days.	He has been absent **for** three days.	for + period
18	Hardly had I entered the room than the light went out.	Hardly had I entered the room **when** the light went out.	Hardly ... when

19	A lot of equipments were damaged.	A lot of **equipment was** damaged.	Uncountable
20	He is one of the best officer of the bank.	He is one of the best **officers** of the bank.	one of the + plural noun

Last-minute grammar checklist

each/every → singular · nearer subject with either/neither/or/nor · "as well as / with" ignored · since (point) / for (period) · yesterday/ago → past · no future after if/when · no sooner...than, hardly... when · high time + past · If I were · had better + V1 · insist/suggest that + V1 · senior/prefer + to · an hour, a university · result in / from · abide by, accused of, married to · look forward to + V-ing · no "about" after discuss, no "of" after comprise · unique has no degree · than any other · lest ... should.

Chapter 5 — Written English: Focus Writing, Paragraph, Letter, Translation

English Language Proficiency 30 (AP) · Focus Writing English 10 · Translation B↔E 10 + 10 · Letter 10

The written English part of bank IT exams has come in four forms: **Focus/essay** (10–20 marks), **paragraph + sentence making** (with 10 grammar items — grammar is in Chapter 4), **letter/application** (10) and **translation** Bangla→English and English→Bangla (10 + 10). None of these needs literary talent. They need a **fixed structure**, **Bangladesh examples**, and **short, error-free sentences**. This chapter gives you all three, plus ready models for every past topic.

Paper	Written English / non-tech part
Combined 5 Bank AP, 03.02.2023 (A) · BB AP, 03.02.2023 (B)	Focus 10 + Translation 20
Combined 5 Bank AP, 09.02.2024 (C)	Focus 20 + Letter 10
BSCS AP / Officer (IT), 03.01.2026 (D)	Bangla essay, English essay, 2 translations, 10 GK
BSCS Various Bank AP, 17.01.2026 (E)	English 30: 10 grammar items + paragraph + sentence making
BSCS AME/AE (IT), 24.01.2026	Translation 10 + 10 + one Focus
BSCS SO (IT), 25.07.2026 (25104)	Focus Bangla 10 + Focus English 10 + Translation B→E 10 + E→B 10 + GK 10

> **Time budget in the hall**
> English 30 in about 18 minutes: grammar first (quick marks) → sentence making (4–5 min) → paragraph/focus (10–12 min). A 10-mark focus or translation: 10–12 minutes. Never leave the English part blank to finish one more IT question — the first 6 marks of a paragraph are the easiest marks in the paper.

5.1 How Written English Is Marked — and the 5-Part Focus Template

5.1.1 What the examiner looks for

BIBM/BSCS do not publish a rubric, but examiners usually mark a 10-mark focus or paragraph on these five areas (typical practice):

Area	Approx. weight	What earns marks	What loses marks
Content & relevance	3–4	Stays on the exact topic; 3 clear points; Bangladesh examples	General talk, memorised essay on a different topic
Organisation	2	Intro → points → challenges → recommendations → conclusion; linking words	One long block with ideas jumping around

Grammar accuracy	2	Correct tense, subject-verb agreement, articles, prepositions	Repeated basic errors ("people is", "discuss about")
Vocabulary & style	1–2	Precise terms (financial inclusion, interoperable, cyber resilience)	Slang, Banglish, exaggeration ("very very important")
Length & presentation	1	Within the word limit; neat; a title	Half a page of crossing-out; far too short or long

5.1.2 The 5-part focus-writing template (150–250 words)

Template — memorise this skeleton

1. **Introduction (25–35 words, 2 sentences):** define the topic + say why it matters *now* in Bangladesh.
2. **Three main points (90–110 words):** one point = one idea + one Bangladesh example (NPSB, Bangla QR, MFS, agent banking, e-KYC, Smart Bangladesh 2041, the 2016 reserve heist…). Start each with *First / Second / Finally* or *Moreover / In addition*.
3. **Challenges (30–40 words):** 2–3 problems — cyber risk, low digital literacy, infrastructure, skills, policy gaps, rural–urban divide.
4. **Recommendations (30–40 words):** 3 concrete actions with an actor — "Banks should…", "Bangladesh Bank should…", "The government should…".
5. **Conclusion (15–25 words, 1 sentence):** restate the topic positively and link it to a national goal (inclusive growth, cashless economy, Smart Bangladesh).



Figure 5.1: The 5-part focus template — the same skeleton fits almost every banking, ICT or social topic.

2-minute plan before you write

Write the title. In the margin, jot 3 keywords for the points, 2 for challenges, 3 for recommendations. Then write. A plan stops you from repeating ideas and running out of time. Use a title even if the question does not ask for one.

Paragraph vs focus vs essay

Paragraph = ONE block, no sub-headings, 120–200 words. **Focus writing** = one or two blocks, 150–250 words, may have a title. **Essay** (20 marks) = several paragraphs, may use sub-headings (Introduction, Benefits…). If the question says "paragraph", do not break it into many paragraphs or add headings.

5.1.3 Linking words (cohesive devices)

Purpose	Linking words

Adding a point	Moreover, Furthermore, In addition, Besides, Also, Not only… but also
Sequence	First, Second, Third, Finally, To begin with, Lastly
Contrast	However, Nevertheless, On the other hand, Although, Despite (+ noun), Yet, Whereas
Cause	Because, Since, As, Due to (+ noun), Owing to (+ noun), Thanks to
Result	Therefore, Thus, As a result, Consequently, Hence, So
Example	For example, For instance, Such as, In particular, Notably
Emphasis	Indeed, In fact, Above all, Most importantly, Clearly
Concluding	In conclusion, To sum up, In short, All things considered, Overall

Linking-word traps

"**Despite of**" is wrong → *despite* or *in spite of*. "**Although… but**" is wrong — use only one. "**Due to**" takes a noun (*due to poor network*), not a clause. Put a comma after *However,* / *Moreover,* at the start of a sentence. Do not start every sentence with a linker — 4–6 in a paragraph is enough.

5.1.4 Thirty ready phrases that lift marks

#	Where to use	Phrase
1	Opening	In today's digital age, … has become an essential part of …
2	Opening	… has emerged as a driving force behind …
3	Opening	For a developing country like Bangladesh, … is no longer a choice but a necessity.
4	Opening	Over the past decade, Bangladesh has witnessed a remarkable shift towards …
5	Definition	Simply put, … refers to …
6	Importance	… plays a pivotal role in …
7	Importance	… lies at the heart of …
8	Example	A case in point is …
9	Example	This is evident from the rapid growth of …
10	Benefit	… has made services faster, cheaper and more accessible.
11	Benefit	… has brought millions of unbanked people into the formal financial system.
12	Benefit	… reduces transaction costs and saves valuable time.
13	Benefit	… opens up new opportunities for …
14	Benefit	… enhances transparency and accountability.
15	Turning to problems	However, this progress is not without challenges.
16	Problem	… poses a serious threat to …
17	Problem	A lack of digital literacy, especially among rural and elderly people, remains a major barrier.

18	Problem	… could undermine public trust in …
19	Problem	The gap between urban and rural areas is still wide.
20	Lesson	The 2016 Bangladesh Bank reserve heist was a wake-up call for …
21	Recommendation	To address these challenges, a multi-pronged approach is needed.
22	Recommendation	Banks should invest in …, while regulators should …
23	Recommendation	Awareness campaigns in Bangla can go a long way towards …
24	Recommendation	Public–private partnership is essential to …
25	Recommendation	A balance must be struck between innovation and consumer protection.
26	Recommendation	Capacity building of the workforce should be given top priority.
27	Future	… holds enormous potential for …
28	Conclusion	In conclusion, … is the key to building an inclusive and Smart Bangladesh.
29	Conclusion	If used wisely, … can make … more efficient, secure and inclusive.
30	Conclusion	The time has come for all stakeholders to work together to …

Safe Bangladesh fact bank (stable — use freely)

Payment rails: RTGS (high-value, real-time, each transaction settled individually), BEFTN (batch electronic fund transfer), NPSB (National Payment Switch Bangladesh — interbank ATM/POS/internet transfers), BACH/BACPS (cheque clearing), Bangla QR (interoperable QR payment). **Inclusion:** MFS (bKash, Nagad, Rocket), agent banking, Tk 10 farmers' accounts, e-KYC. **Regulators:** Bangladesh Bank, BFIU (anti-money laundering). **Vision:** Smart Bangladesh 2041 — four pillars: Smart Citizen, Smart Government, Smart Economy, Smart Society. **Lesson:** USD 81 million stolen from Bangladesh Bank's account at the New York Fed through fraudulent SWIFT messages in February 2016.

Do not write exact user numbers, percentages or budget figures unless you are sure — write "millions of", "a large share of" instead.

5.2 Model Focus Writings and Paragraphs

Each model follows the 5-part template and stays within 150–250 words. Learn the **structure and the phrases**, not every word: in the hall, the same skeleton can be bent to fit a new title. Past topics come first (5.2.1), then ten must-prepare topics (5.2.2).

5.2.1 Past topics — fully written

Paragraph: Street Food Culture in Dhaka E · AP 17.01.2026

Model (≈190 words): Street food is an inseparable part of everyday life in Dhaka. From fuchka and chotpoti near the university areas to jhalmuri on the footpaths and kebabs in Old Dhaka, the city offers cheap and tasty food at almost every corner. For students, office workers and rickshaw pullers alike, these stalls provide quick meals at affordable prices. During Ramadan, the iftar market of Chawkbazar becomes a cultural festival in itself. Street food also supports thousands of small vendors and their families, making it an important part of the informal economy. However, the culture faces serious challenges. Many stalls use unsafe water, reused oil and uncovered food, which can cause diarrhoea, typhoid and other diseases. Most vendors have no training in hygiene, and monitoring by the authorities is weak. If the city corporations introduce licensing, basic hygiene training and designated vending zones with clean water, Dhaka's street food can become both safe and a major attraction for tourists. Vendors can also accept payments through MFS and Bangla QR to avoid handling cash with food. With proper care, this colourful tradition can continue to feed the city while protecting public health.

English essay/focus: Online Banking D · BSCS 03.01.2026

Model (≈210 words): Online banking allows customers to check balances, transfer funds, pay bills and open deposits through the internet or a mobile app without visiting a branch. In a busy country like Bangladesh, it has become one of the most important services a bank can offer. First, it saves time and money. A customer in Rangpur can send money to Chattogram in seconds through NPSB or BEFTN, and high-value payments move through RTGS. Second, it is available 24/7, so salaried people no longer need to take leave to stand in a branch queue. Third, it helps the economy go cashless: bills, tuition fees and taxes can be paid online, and shops accept Bangla QR. Moreover, banks gain digital data that helps them make better credit and risk decisions. However, online banking faces real challenges. Phishing, OTP fraud and weak passwords put customers at risk, many rural and elderly people lack digital skills, and internet coverage is still uneven. To overcome these problems, banks should use multi-factor authentication and real-time fraud monitoring, design simple Bangla-language apps, and run regular awareness campaigns, while following Bangladesh Bank's ICT security guidelines. In conclusion, with security and trust in place, online banking can become the backbone of a cashless and inclusive Smart Bangladesh.

Focus: Growing Use of Technology in the Financial Service Industry B · BB AP 2023

Model (≈195 words): Technology has moved from a support function to the very core of financial services. Today a bank is judged not only by its branches but also by the quality of its apps, payment channels and data systems. First, technology has widened access. Core banking lets customers transact from any branch, while ATMs, agent outlets and mobile financial services have brought millions of unbanked people in Bangladesh into the formal system. Second, it has made payments faster and cheaper: RTGS, BEFTN, NPSB and Bangla QR now move money between banks within seconds or hours instead of days. Third, data analytics and artificial intelligence allow fintech firms to score credit for small borrowers without collateral, and RegTech tools help regulators detect money laundering. As a result, costs fall, transparency rises and services reach the doorstep. However, greater dependence on technology brings cyber attacks, data-privacy concerns and the risk of excluding people without digital skills. Financial institutions should therefore invest in cyber security and skilled IT staff, educate customers, and work with regulators to balance innovation with consumer protection. In short, technology used wisely can make the financial sector more efficient, resilient and inclusive.

Focus: Data Is the New Compute in Today's AI Era BSCS AME/AE 24.01.2026

Model (≈200 words): For years, progress in computing was measured by faster processors. In today's AI era, however, the real competitive edge comes from data. Powerful chips and cloud servers can be rented by anyone, but large volumes of clean, relevant and well-labelled data cannot. That is why many experts say that data is the new compute. First, AI models learn only what their data shows them. A fraud-detection model in a bank is only as good as the transaction history it was trained on. Second, data turns ordinary services into smart ones: banks and MFS providers in Bangladesh can use payment records to offer small loans to customers who have no formal credit history. Third, data supports better national planning, from agriculture to traffic, which is a core idea of Smart Bangladesh 2041. However, this power comes with risks. Poor-quality or biased data leads to unfair decisions, and careless storage invites breaches and misuse of personal information. Therefore, organisations should invest in data governance, cleaning and secure storage, while the state should ensure a strong data protection law and open-data policies for public benefit. In conclusion, a country that manages its data wisely will lead in the age of artificial intelligence.

Focus (English): The Importance of Digital Literacy in Expanding Cashless Transactions in Bangladesh SO IT 2026 (25104)

Model (≈195 words): Bangladesh has built impressive digital payment infrastructure. Mobile financial services reach people in every district, NPSB connects banks in real time, and Bangla QR allows even a small shopkeeper to accept payments from any bank or MFS app. Yet infrastructure alone cannot create a cashless economy; people must know how to use it safely and confidently. Digital literacy is therefore the bridge between access and actual use. First, a person who can read an SMS alert, check a merchant's name before paying and protect a PIN is far more likely to keep money in a digital account. Second, digital skills drive financial inclusion: rural women, farmers and small traders who learn to use mobile wallets receive government allowances, savings and micro-credit without travelling to a branch. Third, literacy protects trust. Fake calls asking for OTPs succeed mainly because users do not know the basic rules. To expand cashless transactions, banks and regulators should run awareness campaigns in Bangla, design simple and voice-guided apps, train agents as local educators and include digital finance in school curricula. When citizens are digitally literate, cashless payments become not only convenient but also secure and inclusive.

Focus (set as the Bangla Focus — English version for practice): Digital Transformation of Bangladesh's Banking Sector under the Fourth Industrial Revolution SO IT 2026 (25104)

Model (≈185 words): The Fourth Industrial Revolution (4IR) is the fusion of artificial intelligence, blockchain, cloud computing, big data and the Internet of Things. It is changing the banking sector of Bangladesh at its roots. Services that once required a customer to stand in a branch queue are now completed in seconds on a mobile app. First, customer service has been transformed: accounts can be opened from home through e-KYC, payments are made with Bangla QR, and chatbots answer queries at any hour. Second, risk management has become smarter, as AI systems flag suspicious transactions and help assess borrowers. Third, new business models such as digital banks and fintech partnerships are emerging. However, the challenges are serious. Cyber attacks are growing, and the 2016 reserve heist remains a painful lesson. Many rural customers lack digital literacy, and banks face a shortage of skilled IT professionals. Therefore, banks should build strong cyber-security infrastructure, reskill their staff, and educate customers, while Bangladesh Bank should keep its regulatory framework up to date. With the right planning, the Fourth Industrial Revolution can make our banking sector more efficient, transparent and inclusive.

Essay (set in Bangla — English version for practice): The Role of Youth in Building a Corruption-Free Country D · BSCS 03.01.2026

Model (≈180 words): Corruption is the misuse of public power or trust for private gain, and it is one of the biggest barriers to development in Bangladesh. It wastes public money, delays services and destroys people's faith in institutions. The youth, who form a large share of our population, can lead the fight against it. First, young people can set an example by refusing to give or take bribes in their own lives, whether for admission, a job or a trade licence. Second, they are skilled in technology. They can use digital public services, online tax filing and cashless payments, which reduce face-to-face contact and the scope for bribery. Third, they can raise awareness through volunteering, debate clubs and social media, and use the Right to Information Act to demand accountability. However, unemployment, political pressure and fear of harassment often discourage honest youth. The government should protect whistle-blowers, make services fully digital and transparent, and include ethics in education, while families and teachers must value honesty over quick success. If the young generation chooses integrity, a corruption-free and prosperous Bangladesh is achievable.

5.2.2 Ten must-prepare topics

1. Digital Banking and a Cashless Bangladesh (≈190 words)

Digital banking means delivering banking services through electronic channels such as mobile apps, internet banking, cards, ATMs and QR codes. A cashless economy is one where most payments are made digitally instead of with notes and coins. Bangladesh is moving steadily towards this goal. First, digital payments are fast and cheap. Salaries, utility bills and government allowances can be paid instantly through BEFTN, NPSB and MFS. Second, they are safer and more transparent: digital records reduce theft, counterfeit notes and tax evasion. Third, they save the cost of printing, transporting and guarding cash, which benefits both banks and the state. Bangla QR, launched by Bangladesh Bank, has made it possible for small shops to accept payment from any bank or MFS app. However, many people still prefer cash because of habit, low digital literacy, merchant charges and fear of fraud. Network problems in remote areas add to the difficulty. To speed up the change, banks should lower charges for small payments, the government should make all public fees payable digitally, and awareness campaigns should teach safe usage. In conclusion, a cashless Bangladesh will be a more efficient, transparent and inclusive Bangladesh.

2. Cyber Security in Banking (≈195 words)

As banking becomes digital, money increasingly moves as data, and data can be stolen. Cyber security is the practice of protecting systems, networks and customer information from such attacks. For banks, it is now as important as the vault. The threats are many. Phishing emails trick employees into revealing passwords, ransomware locks critical servers until a ransom is paid, and fraudsters call customers pretending to be bank officials to collect OTPs. ATM skimming and insider fraud are also common. The 2016 Bangladesh Bank reserve heist, in which USD 81 million was stolen through fraudulent SWIFT messages, showed how a single weakness can cause a national disaster. A successful attack causes financial loss, legal penalties and, most damaging of all, loss of public trust. To stay safe, banks should follow Bangladesh Bank's ICT security guidelines and build layered defences: firewalls, intrusion detection, encryption, multi-factor authentication and a 24/7 security operations centre. Regular penetration testing, data backups and staff training are equally essential. Customers, too, must learn one simple rule: never share a PIN or OTP with anyone. In conclusion, without strong cyber security, the dream of a cashless and Smart Bangladesh cannot be realised.

3. Artificial Intelligence in Banking (≈185 words)

Artificial intelligence (AI) is the ability of computer systems to learn from data and perform tasks that normally need human intelligence. In banking, it is changing how services are delivered and risks are managed. First, AI improves customer service. Chatbots and virtual assistants can answer common queries in Bangla and English at any hour, reducing pressure on call centres. Second, AI strengthens security. Machine-learning models study normal behaviour and flag unusual transactions in real time, helping to stop card fraud and detect money laundering. Third, AI enables smarter lending. By analysing transaction history and mobile-wallet data, banks can assess the creditworthiness of farmers and small entrepreneurs who have no formal records. AI also automates routine back-office work such as document checking. However, AI depends on large amounts of quality data, and biased data can lead to unfair decisions. There are also concerns about privacy, job losses and "black-box" models that nobody can explain. Banks should therefore protect customer data, keep humans responsible for key decisions, reskill employees and make models explainable to regulators. With sound governance, AI can make banking faster, safer and more inclusive.

4. Smart Bangladesh 2041 (≈185 words)

Smart Bangladesh 2041 is the national vision of building a knowledge-based, innovative and technology-driven country by 2041. It follows the earlier Digital Bangladesh programme and rests on four pillars: Smart Citizen, Smart Government, Smart Economy and Smart Society. A smart citizen is digitally skilled and connected; a smart government delivers paperless, transparent services; a smart economy runs on cashless payments, e-commerce and innovation; and a smart society is inclusive and well informed. Banking has a central role in this vision. Digital payments, e-KYC, agent banking and Bangla QR are already bringing ordinary people into the financial system. At the same time, artificial intelligence, the Internet of Things and data-driven planning can improve agriculture, health and education. However, the journey faces obstacles. The digital divide between cities and villages, a shortage of skilled ICT professionals, cyber threats and weak data protection could slow progress. To achieve the goal, the government should expand affordable high-speed internet, invest in ICT education and research, and protect citizens' data, while the private sector should innovate responsibly. If all stakeholders work together, Smart Bangladesh 2041 can turn our demographic dividend into lasting prosperity.

5. Financial Inclusion and Mobile Financial Services (≈195 words)

Financial inclusion means that every individual and business, including the poor, has access to useful and affordable financial services such as savings, payments, credit and insurance. In Bangladesh, mobile financial services (MFS) have been the biggest driver of this change. With only a basic mobile phone, a garment worker can receive her salary, a rickshaw puller can send money to his family in the village, and a farmer can receive a government allowance. bKash, Nagad, Rocket and other providers serve customers through a wide network of agents, even in remote areas. Agent banking, Tk 10 farmers' accounts and school banking have widened access further. As a result, people save more safely, women gain more control over money, and remittances reach families quickly. However, challenges remain. Many users only cash out instead of saving, cash-out charges are a burden for the poor, and fraud by fake calls is common. Moreover, access to formal credit for micro-entrepreneurs is still limited. Providers should cut charges, add savings and micro-loan products, and train agents to educate customers, while regulators should ensure interoperability and consumer protection. In conclusion, MFS can turn financial inclusion from a slogan into a reality.

6. Fintech and the Future of Finance (≈185 words)

Fintech, short for financial technology, refers to the use of software, mobile apps, data analytics and new business models to deliver financial services. It is reshaping finance all over the world, and Bangladesh is no exception. First, fintech makes payments easy. Payment gateways, MFS wallets and QR payments let e-commerce sites and small merchants accept money instantly. Second, it opens new sources of credit. Digital lending platforms analyse mobile and transaction data to give small loans within minutes, often without collateral. Third, it lowers costs for banks, which partner with fintech firms instead of building every service themselves. Regulatory sandboxes allow new ideas to be tested safely. However, rapid growth brings risks. Unlicensed apps may misuse personal data or charge hidden fees, cyber fraud is increasing, and existing laws do not always cover new products. Many start-ups also struggle to raise funds. To get the best out of fintech, the regulator should provide clear and flexible rules, banks should collaborate rather than compete, and customers should be educated about safe use. In conclusion, fintech, guided by sound regulation, can make finance faster, cheaper and more inclusive.

7. e-KYC: Opening the Door to Digital Banking (≈180 words)

Know Your Customer (KYC) is the process by which a financial institution verifies the identity of its customer. Electronic KYC, or e-KYC, does the same digitally: the customer's National ID data is checked against the national database, a live photo is matched with the NID photo, and the account is opened within minutes. In Bangladesh, BFIU's e-KYC guideline has allowed banks, MFS providers and insurers to onboard customers in this way. The benefits are clear. First, a person can open an account from home or at an agent point without filling in long paper forms. Second, the cost of onboarding falls sharply, so serving low-income customers becomes profitable. Third, digital verification reduces fake identities and supports anti-money laundering efforts. However, e-KYC depends on reliable NID data and internet connectivity, and poorly protected systems can leak sensitive personal data. Some elderly or rural people also need help using the process. Institutions should therefore secure their data, use strong liveness checks against fraud, and provide assisted e-KYC at agent points. In short, e-KYC is the gateway that makes inclusive digital banking possible.

8. Green Banking and Climate Change (≈185 words)

Bangladesh is one of the countries most vulnerable to climate change. Rising sea levels, salinity, floods and cyclones threaten lives, crops and livelihoods, especially in the coastal belt. Green banking is the banking sector's response. It means financing environment-friendly projects, reducing banks' own carbon footprint and avoiding loans to polluting businesses. Bangladesh Bank has encouraged this through its green banking and sustainable finance policies and refinance schemes. First, banks can finance solar home systems, effluent treatment plants, energy-efficient factories and green buildings. Second, they can go paperless by promoting online banking, e-statements and digital approvals, which also cut costs. Third, environmental risk assessment before lending protects both nature and the bank, since a polluting factory may later be shut down and fail to repay. However, green projects often need long-term funds, their returns may seem uncertain, and many bankers lack expertise in assessing climate risk. Moreover, "greenwashing" — false environmental claims — must be prevented. Banks should train officers, offer lower-cost green loans and report their sustainability performance honestly. In conclusion, green banking is not charity; it is a smart investment in Bangladesh's survival and future.

9. Youth Unemployment and Skills Development (≈190 words)

Bangladesh has a large young population, which can be a great asset. However, many graduates remain unemployed or work in jobs below their qualifications, while employers complain that they cannot find skilled workers. This mismatch is at the heart of youth unemployment. First, our education system still focuses heavily on memorisation and certificates rather than practical skills such as programming, communication and problem solving. Second, technical and vocational training is often seen as a second-class option, although industries badly need technicians. Third, the job market is changing fast: automation and artificial intelligence are replacing routine jobs while creating new ones in data, cyber security and digital services. Freelancing has shown that skilled young Bangladeshis can earn from global markets. The consequences of inaction are serious: frustration, brain drain and social unrest. To solve the problem, universities should update their curricula with industry input, the government should expand vocational and ICT training, and banks should provide easy start-up loans for young entrepreneurs. Internships and career counselling should also be made widely available. In conclusion, if we equip our youth with the right skills, the demographic dividend can drive Bangladesh's growth.

10. Data Privacy in the Digital Age (≈190 words)

Every time we use a mobile app, pay online or open a bank account, we leave personal data behind: our name, NID number, location, contacts and spending habits. Data privacy is the right of individuals to control how this information is collected, used and shared. In a digital Bangladesh, it has become a serious concern. First, banks, MFS providers and e-commerce firms hold huge amounts of sensitive data, and a single breach can expose millions of people to fraud. Second, leaked NID and phone data are often used for SIM fraud and fake calls. Third, some apps collect far more data than they need and share it without the user's consent. Strong privacy protects not only individuals but also trust in the digital economy. However, awareness is low, many organisations lack proper security controls, and the legal framework for personal data protection is still developing (verify latest). The government should enact and enforce a comprehensive data protection law; organisations should collect only necessary data, encrypt it and report breaches; and citizens should read permissions before installing apps. In conclusion, privacy is the foundation of trust in a Smart Bangladesh.

5.2.3 Quick outlines for other likely topics

If a new topic comes, fit these points into the same 5-part template.

Topic	Three points	Challenges	Recommendations
Remittance and the economy	Foreign currency reserve; family income in villages; digital channels (bank, MFS)	Hundi; high cost; fraud	Incentives for legal channels; easy app transfers; migrant training
Agent banking	Banking at village doorstep; deposits, remittance, allowances; low cost	Agent fraud; cash security; limited products	Agent training; real-time monitoring; add loans/insurance
Cloud computing in banks	Scalability; lower cost; disaster recovery	Data location; vendor lock-in; security	Follow regulator's guideline; encryption; hybrid model
Blockchain in finance	Tamper-proof records; trade finance/LC; faster cross-border payment	Regulation; energy; skills	Pilot projects; clear rules; training
Cyber security awareness for customers	Never share PIN/OTP; check links; use official apps	Low awareness; social engineering	SMS/TV campaigns in Bangla; instant blocking hotline
Women in ICT / women's financial inclusion	Freelancing; MFS ownership; women entrepreneurs	Social barriers; low access to devices; safety online	Special loans; training; safe digital spaces
Inflation and the common people	Rising food prices; falling real income; savings eroded	Supply shocks; exchange rate; market syndicates	Monetary tightening; market monitoring; social safety nets

E-commerce in Bangladesh	Online shopping; jobs for youth; rural sellers via social media	Trust; delivery; payment fraud	Escrow payment; consumer law enforcement; digital ID for sellers
Freelancing and IT exports	Foreign earnings; youth jobs; global skills	Payment receiving; internet; skills gap	Easy inward remittance; training; tax clarity
Online education	Access anywhere; low cost; flexible	Device and internet gap; low engagement	Cheap data packs; blended learning; teacher training

5.3 Sentence Making

Rules for full marks

1. **Keep the word exactly as given** — same spelling and same part of speech. If the word is an adjective (*judicious*), do not write *judiciously*. You may change the tense or number of a verb only if the question allows it; safest is to use the exact form.
2. **Show the meaning through context.** "This is a judicious decision" proves nothing; "A judicious use of public funds can speed up rural development" shows you know the meaning.
3. Write **one complete sentence of 10–20 words**, with a clear subject and verb. Do not write "Judicious means wise."
4. Prefer **banking/ICT/formal contexts** — they sound natural and match the exam.
5. For a **phrase or idiom**, use it in its idiomatic sense (*at the eleventh hour* = at the last moment), not literally.

Make sentences with the following words E · AP 17.01.2026

Word (part of speech)	Meaning	Model sentence
Judicious (adjective)	wise, sensible	A judicious use of public funds can speed up rural development.
Condone (verb)	accept or forgive wrongdoing	The bank will not condone any breach of its information security policy.
Fabricate (verb)	invent falsely; forge	The borrower tried to fabricate documents to obtain a large loan.
Accentuate (verb)	make more noticeable	The new app design accentuates the most important account information.
Multifaceted (adjective)	having many sides	Cyber security is a multifaceted challenge for modern banks.

5.3.1 Thirty more commonly asked words and phrases

Word / phrase (POS)	Meaning	Model sentence

Mitigate (v)	reduce the harm of	Multi-factor authentication helps banks mitigate the risk of account takeover.
Comply with (v)	obey a rule	All banks must comply with the anti-money laundering guidelines of BFIU.
Adhere to (v)	follow strictly	Employees must adhere to the password policy at all times.
Leverage (v)	use to advantage	Banks can leverage customer data to design better loan products.
Robust (adj)	strong, reliable	A robust backup system kept the bank running during the server failure.
Vulnerable (adj)	easily harmed	Outdated software makes a network vulnerable to ransomware attacks.
Inevitable (adj)	certain to happen	With the spread of smartphones, the shift to digital payments is inevitable.
Obsolete (adj)	out of date	Paper passbooks are becoming obsolete in the age of mobile banking.
Mandatory (adj)	compulsory	Two-factor authentication is mandatory for all internet banking transfers.
Prudent (adj)	careful, sensible	It is prudent to keep an emergency fund before investing in shares.
Resilient (adj)	able to recover quickly	The economy proved resilient despite the global crisis.
Lucrative (adj)	very profitable	Software exports have become a lucrative sector for young entrepreneurs.
Alleviate (v)	make less severe	Microcredit has helped alleviate poverty in many rural areas.
Scrutinize (v)	examine closely	The auditor will scrutinize every large transaction made last month.
Embezzle (v)	steal money in one's trust	The cashier was arrested for embezzling depositors' money.
Waive (v)	give up a charge or right	The bank has decided to waive the annual fee for student accounts.
Nascent (adj)	just beginning	Blockchain banking is still at a nascent stage in Bangladesh.
Pragmatic (adj)	practical	The committee took a pragmatic approach to reduce loan defaults.
Transparent (adj)	open, clear	A transparent recruitment process builds public confidence.

Accountability (n)	being answerable	Digital records increase accountability in public spending.
Sustainable (adj)	able to continue long-term	Green banking supports sustainable growth without harming the environment.
Enhance (v)	improve	The new mobile app will enhance the customer experience.
In lieu of (prep. phrase)	instead of	Employees may take a day off in lieu of overtime payment.
By dint of (prep. phrase)	by means of	She became a successful programmer by dint of hard work.
At the eleventh hour (idiom)	at the last moment	The investor pulled out of the deal at the eleventh hour.
Pull out of (phr. v)	withdraw from	The foreign partner decided to pull out of the project.
Take by surprise (idiom)	astonish	The sudden cyber attack took the IT team by surprise.
Bear the brunt of (idiom)	suffer the worst part	Low-income families bear the brunt of high inflation.
A blessing in disguise (idiom)	something bad that turns out good	The system crash was a blessing in disguise, as it forced us to upgrade security.
Look into (phr. v)	investigate	The bank promised to look into my complaint within seven working days.
Put off (phr. v)	postpone	The board put off the meeting until the audit report was ready.
Run out of (phr. v)	have no more left	The ATM ran out of cash on the eve of Eid.
In the long run (phrase)	over a long period	Investment in staff training pays off in the long run.
Cope with (phr. v)	deal successfully with	Banks must upgrade their servers to cope with heavy online traffic.

Sentence-making traps

Comply takes *with*; **adhere** takes *to*; **cope** takes *with*. **Waive** (give up) ≠ **wave** (move a hand). **Affect** (v) ≠ **effect** (n). A sentence that defines the word ("Robust means strong.") gets zero.

5.4 Letter, Email and Application

A 10-mark letter appeared in Combined 5 Bank AP, 09.02.2024 (Paper C: Focus 20 + Letter 10). Expect an official letter, an application or a formal email in a banking context.

5.4.1 Format — formal letter / application (block format)

Formal letter skeleton

1. **Date** — 29 October 2026 (write the month in words).
2. **Recipient** — designation, organisation, address (e.g. The Branch Manager, XYZ Bank PLC, Motijheel Branch, Dhaka-1000).
3. **Subject** — one line, starts with "Subject:" (e.g. Subject: Application for three days' casual leave).
4. **Salutation** — Dear Sir/Madam, (or "Sir," in Bangladeshi official style).
5. **Body** — 3 short paragraphs: (i) purpose, (ii) details/reason with facts, (iii) request/action.
6. **Closing** — Yours faithfully, (when you began with Sir/Madam) · Yours sincerely, (when you began with the person's name).
7. **Signature block** — signature, name, designation/ID, contact; "Enclosure:" if documents are attached.

Item	Letter / application	Email
Heading	Date, recipient address	To / Cc / Subject line (no address)
Opening	Dear Sir/Madam,	Dear Mr Rahman, / Dear Sir,
First line	I am writing to …	I am writing to … (purpose in line 1)
Closing	Yours faithfully, / Yours sincerely,	Best regards, / Kind regards,
Attachments	Enclosure: …	"Please find attached …"

Useful lines

Opening: *I am writing to inform you that… / to request… / to draw your attention to…* · Request: *I would be grateful if you could… / I therefore request you to…* · Closing: *Thank you for your kind consideration. / I look forward to your prompt action.*

Model 1 — Leave application to a manager

29 October 2026
The Manager
XYZ Bank PLC
Agrabad Branch, Chattogram

Subject: Application for three days' casual leave

Dear Sir,
I respectfully state that I am working as a Junior Officer (IT) in your branch. I would like to request casual leave for three days, from 2 November to 4 November 2026.
My mother has been admitted to Chattogram Medical College Hospital for an operation, and as the only son in the family I need to stay with her. Before leaving, I will hand over my pending tasks, including the daily ATM reconciliation and user-access requests, to Mr Karim Ahmed, who has agreed to cover my duties. I will also remain available on my mobile phone for any urgent issue.
I therefore request you to kindly grant me casual leave for the above period. I shall resume my duties on 5 November 2026.

Yours faithfully,
(Signature)
Md. Rafiq Hasan
Junior Officer (IT), Employee ID 10457
Mobile: 01XXXXXXXXX

Model 2 — Complaint to a bank about a failed transaction (email)

To: customercare@xyzbank.com.bd
Subject: Complaint: Tk 10,000 debited but cash not dispensed at ATM (Card ending 4821)

Dear Sir/Madam,
I am writing to report a failed ATM transaction. On 27 October 2026 at about 7:15 pm, I tried to withdraw Tk 10,000 from the NPSB-connected ATM of ABC Bank at Mirpur-10, Dhaka, using my XYZ Bank debit card (ending 4821). The machine showed "Transaction cannot be processed" and did not dispense any cash, but I immediately received an SMS stating that Tk 10,000 had been debited from my savings account (No. 1234567890).
I reported the incident to your call centre the same evening (complaint reference CC-778215), and I was told that the amount would be reversed automatically. However, three working days have passed and the amount has not yet been credited back.
I would be grateful if you could investigate the matter with the acquiring bank, check the ATM's cash and journal records, and reverse the amount to my account at the earliest. Please find attached a screenshot of the SMS alert and a copy of my account statement.
I look forward to your prompt action.

Best regards,
Nusrat Jahan
Account No. 1234567890 · Mobile: 01XXXXXXXXX

Model 3 — Job application / cover letter

29 October 2026
The General Manager (HR)
XYZ Bank PLC
Head Office, Motijheel C/A, Dhaka-1000

Subject: Application for the post of Assistant Programmer

Dear Sir/Madam,
With reference to your advertisement published on the Bankers' Selection Committee website, I would like to apply for the post of Assistant Programmer. I believe my education and practical experience match the requirements of the position.
I hold a BSc in Computer Science and Engineering from a public university. During my studies and internship, I developed a web-based loan-management module using Java, Spring Boot and Oracle, wrote optimised SQL queries and stored procedures, and worked with Git in an Agile team. I am also familiar with Linux administration, REST APIs and basic information-security practices such as role-based access control and secure password storage. These skills will allow me to contribute to your core banking, digital channel and reporting systems from the very first day.
I am hard-working, disciplined and eager to learn the banking domain. I would welcome the opportunity to discuss my application at an interview. My curriculum vitae and copies of my certificates are enclosed.

Yours faithfully,
(Signature)
Tanvir Ahmed
Mirpur, Dhaka · Mobile: 01XXXXXXXXX · Email: tanvir@example.com
Enclosure: CV, certificates, NID copy, photographs

Letter traps

Do not write "Respected Sir" + "Yours sincerely" (mismatch); use "Dear Sir," + "Yours faithfully,". Do not forget the subject line — it alone can carry 1 mark. Do not use your real name if the question says "write as X"; use the name given or "ABC". Avoid "Kindly do the needful" — say exactly what you want done.

5.5 Translation — Bangla ↔ English

Translation carries 10 + 10 marks in many bank papers (Paper A, B, D, AME/AE 2026, SO IT 2026). Passages come from newspapers (economy, banking, technology, agriculture), and short items include single sentences and proverbs. (This section intentionally contains Bangla text.)

5.5.1 Technique — both ways

Five steps

1. **Read the whole passage once** and find the main idea and the time (past, present, ongoing).
2. **Split long sentences.** A long Bangla sentence with many "এবং/ও/কিন্তু" can become two or three short English sentences — two correct simple sentences beat one wrong complex sentence.
3. **Translate meaning, not words.** "দোরগোড়ায় পৌঁছে দেওয়া" = *bring to the doorstep*, not "reach the door-step-in". English idioms go to natural Bangla and vice versa: *at the eleventh hour* = একেবারে শেষ মুহূর্তে.
4. **Fix tense and voice.** Use the table below. Bangla often drops the subject; English must have one ("It has been drizzling since morning").
5. **Check names, numbers and terms.** Keep figures exact (Tk 200–600 = ২০০ থেকে ৬০০ টাকা), keep proper names and acronyms (NPSB, MFS), and use standard spelling (সাধু-চলিত mixing is a mistake in Bangla — write চলিত throughout).

Bangla verb form	English tense	Example
করে / করেন	Present indefinite	ব্যাংক সকাল ১০টায় খোলে। — The bank opens at 10 am.
করছে / করছেন	Present continuous	দাম বাড়ছে। — Prices are rising.
করেছে / করেছেন	Present perfect	ব্যাংক চার্জ মওকুফ করেছে। — The bank has waived the charge.
...থেকে করছে	Present perfect continuous	সকাল থেকে বৃষ্টি হচ্ছে। — It has been raining since morning.
করল / করেছিল	Past indefinite / past perfect	তিনি ঋণ পরিশোধ করেছিলেন। — He had repaid the loan.
করবে / করবেন	Future	আগামীকাল ফল প্রকাশ হবে। — The result will be published tomorrow.
করা হয় / করা হচ্ছে	Passive	গ্রাহকদের উৎসাহিত করা হচ্ছে। — Customers are being encouraged.
করতে হবে	must / have to	সবাইকে আইন মানতে হবে। — Everyone must obey the law.

5.5.2 Banking and economy vocabulary (Bangla → English)

Bangla	English	Bangla	English
হিসাব খোলা	open an account	সঞ্চয়ী হিসাব	savings account
চলতি হিসাব	current account	স্থায়ী আমানত	fixed deposit
আমানতকারী	depositor	ঋণগ্রহীতা	borrower
ঋণ বিতরণ	loan disbursement	ঋণ আদায়	loan recovery
খেলাপি ঋণ	non-performing / defaulted loan	ঋণখেলাপি	loan defaulter

জামানত	collateral	সুদের হার	interest rate
কিস্তি	instalment	ঋণ পুনঃতফসিল	loan rescheduling
মওকুফ করা	waive	লেনদেন	transaction
নগদ উত্তোলন	cash withdrawal	তহবিল স্থানান্তর	fund transfer
তারল্য সংকট	liquidity crisis	মূল্যস্ফীতি	inflation
বৈদেশিক মুদ্রার রিজার্ভ	foreign exchange reserve	প্রবাসী আয় / রেমিট্যান্স	remittance
মুদ্রানীতি	monetary policy	রাজস্ব	revenue
বাজেট ঘাটতি	budget deficit	আর্থিক অন্তর্ভুক্তি	financial inclusion
নগদবিহীন লেনদেন	cashless transaction	মোবাইল আর্থিক সেবা	mobile financial service (MFS)
গ্রাহকসেবা	customer service	আস্থা	trust, confidence
স্বচ্ছতা	transparency	জবাবদিহিতা	accountability
অর্থপাচার	money laundering	সন্ত্রাসে অর্থায়ন	terrorist financing
জালিয়াতি	fraud, forgery	তফসিলি ব্যাংক	scheduled bank
কেন্দ্রীয় ব্যাংক	central bank	নিয়ন্ত্রক সংস্থা	regulator
উদ্যোক্তা	entrepreneur	ক্ষুদ্র ও মাঝারি উদ্যোগ	small and medium enterprise (SME)
প্রণোদনা	incentive, stimulus	নিরীক্ষা	audit
পরিচালন ব্যয়	operating cost	ঋণপত্র	letter of credit (LC)
সাইবার নিরাপত্তা	cyber security	তথ্য সুরক্ষা	data protection
মজুত করা	stockpile, hoard	জব্দ করা	seize

48 terms. Also: দুর্নীতি = corruption · অন্তরায় = barrier/obstacle · বঞ্চিত = deprived · প্রাথমিক পর্যায় = nascent/initial stage · অসাধু ব্যবসায়ী = dishonest trader · কৃত্রিম সংকট = artificial crisis.

5.5.3 Past translation questions — solved

Bangla → English (passage) D · BSCS 03.01.2026

বর্তমান ডিজিটাল যুগে গুগল ড্রাইভ এখন শুধু একটি ফাইল সংরক্ষণের জায়গা নয়, বরং এটি পড়াশোনা, অফিসের কাজ ও ব্যক্তিগত নথি ব্যবস্থাপনার একটি গুরুত্বপূর্ণ ডিজিটাল মাধ্যম। প্রতিদিনই কোটি কোটি মানুষ এ ক্লাউড স্টোরেজ সেবার ওপর নির্ভর করছে। তবে নিয়মিত ব্যবহার করলেও অনেকেই জানেন না, গুগল ড্রাইভে এমন কিছু লুকানো ফিচার রয়েছে, যা ব্যবহারকারীর কাজকে আরও সহজ, দ্রুততর ও কার্যকর করে তুলতে পারে। ই-মেইলে বড় ফাইল পাঠানোর ক্ষেত্রে অ্যাটাচমেন্ট সাইজ একটি বড় সমস্যা। তবে জিমেইল ব্যবহারকারীরা গুগল ড্রাইভ থেকে সরাসরি ফাইল যুক্ত করে সহজেই বড় ফাইল পাঠাতে পারেন।

Model answer: In today's digital age, Google Drive is no longer just a place to store files; it has become an important digital medium for studies, office work and the management of personal documents. Every day, hundreds of millions of people rely on this cloud storage service. Yet, even though they use it regularly, many are unaware that Google Drive has some hidden features that can make their work easier, faster and more effective. Attachment size is a major problem when sending large files by e-mail. However, Gmail users can easily send large files by attaching them directly from Google Drive.

Key choices: শুধু... নয়, বরং = no longer just... ; it has become · কোটি কোটি = hundreds of millions (not "crores of crores") · লুকানো ফিচার = hidden features.

English → Bangla (passage) D · BSCS 03.01.2026

From the Aman paddy season to the current winter vegetable cultivation, farmers in many districts have been unable to purchase fertilizers at government-fixed prices. Farmers and government officials allege that dishonest traders are exploiting an "artificial crisis", particularly for non-urea fertilizers, making extra profits. Potato farmers in northern districts are among the worst affected. In many districts, farmers reported paying Tk 200–600 more per 50 kg sack than the government rates for non-urea fertilizers. In response, local administration seized around 12,000 sacks of illegally stockpiled fertilizer.

Model answer: আমন মৌসুম থেকে শুরু করে চলতি শীতকালীন সবজি চাষ পর্যন্ত অনেক জেলার কৃষকেরা সরকার-নির্ধারিত দামে সার কিনতে পারছেন না। কৃষক ও সরকারি কর্মকর্তাদের অভিযোগ, অসাধু ব্যবসায়ীরা বিশেষ করে নন-ইউরিয়া সারের "কৃত্রিম সংকট" তৈরি করে বাড়তি মুনাফা করছেন। উত্তরাঞ্চলের জেলাগুলোর আলুচাষিরা সবচেয়ে বেশি ক্ষতিগ্রস্ত। অনেক জেলায় কৃষকেরা জানিয়েছেন, নন-ইউরিয়া সারের প্রতি ৫০ কেজির বস্তায় তাঁদের সরকারি দামের চেয়ে ২০০ থেকে ৬০০ টাকা বেশি দিতে হচ্ছে। এর প্রেক্ষিতে স্থানীয় প্রশাসন অবৈধভাবে মজুত করা প্রায় ১২ হাজার বস্তা সার জব্দ করেছে।

Key choices: allege = অভিযোগ · among the worst affected = সবচেয়ে বেশি ক্ষতিগ্রস্ত · seized = জব্দ করেছে · stockpiled = মজুত করা.

English → Bangla (passage, opening part as remembered) B · BB AP 2023

Global economic turbulence is strongly felt in the banking and financial industry throughout the globe. The visible transformations are taking place in terms of embracing new recovery efforts by adopting newer technology...

Model answer: বৈশ্বিক অর্থনৈতিক অস্থিরতা সারা বিশ্বের ব্যাংকিং ও আর্থিক খাতে তীব্রভাবে অনুভূত হচ্ছে। নতুন প্রযুক্তি গ্রহণের মাধ্যমে পুনরুদ্ধারের নতুন উদ্যোগ নেওয়ার ক্ষেত্রে দৃশ্যমান পরিবর্তন ঘটছে...

English → Bangla (passage, opening part as remembered) SO IT 2026 (25104)

He decided to pull out of the agreement at the eleventh hour. This sudden move took everyone by surprise and put the entire project at risk...

Model answer: তিনি একেবারে শেষ মুহূর্তে চুক্তি থেকে সরে আসার সিদ্ধান্ত নেন। এই আকস্মিক পদক্ষেপে সবাই বিস্মিত হয় এবং পুরো প্রকল্পটি ঝুঁকির মুখে পড়ে...

Idioms: at the eleventh hour = একেবারে শেষ মুহূর্তে · pull out of = সরে আসা · take by surprise = বিস্মিত করা · put at risk = ঝুঁকির মুখে ফেলা.

Bangla → English (sentences) BSCS AME/AE 24.01.2026

Bangla (question)	English (model answer)
কঠোর নীতিমালার কারণে ক্ষুদ্র উদ্যোক্তারা প্রয়োজনীয় ঋণ সুবিধা থেকে বঞ্চিত হচ্ছে।	Small entrepreneurs are being deprived of necessary loan facilities due to strict policies.
গ্রাহকদের আস্থা অর্জনের জন্য স্বচ্ছতা এবং জবাবদিহিতা অপরিহার্য।	Transparency and accountability are essential to earn customers' trust.
দুর্নীতি দেশের উন্নয়নের অন্তরায়।	Corruption is a barrier to the development of the country.
সকাল থেকে গুঁড়ি গুঁড়ি বৃষ্টি হচ্ছে।	It has been drizzling since morning.
উপদেশ দেওয়ার চেয়ে পালন করা কঠিন।	It is harder to follow advice than to give it. (Practice is harder than preaching.)

English → Bangla (sentences) BSCS AME/AE 24.01.2026

English (question)	Bangla (model answer)
Empty vessels sound much.	খালি কলসি বাজে বেশি।
Customers are encouraged to use online banking services to reduce transaction time and operational costs.	লেনদেনের সময় ও পরিচালন ব্যয় কমাতে গ্রাহকদের অনলাইন ব্যাংকিং সেবা ব্যবহারে উৎসাহিত করা হচ্ছে।
The bank has decided to waive the service charge.	ব্যাংক সার্ভিস চার্জ মওকুফ করার সিদ্ধান্ত নিয়েছে।
The project is still in its nascent stage.	প্রকল্পটি এখনো প্রাথমিক পর্যায়ে রয়েছে।
True greatness lies not in power, but in humility and moral integrity.	প্রকৃত মহত্ত্ব ক্ষমতায় নয়, বরং বিনয় ও নৈতিক সততায় নিহিত।

5.5.4 Practice passages with model answers

Practice 1 (Bangla → English): Mobile financial services

বাংলাদেশে মোবাইল আর্থিক সেবা দ্রুত জনপ্রিয় হচ্ছে। এখন গ্রামের একজন কৃষকও মোবাইল ফোনের মাধ্যমে টাকা পাঠাতে ও গ্রহণ করতে পারেন। এতে সময় ও খরচ দুটোই বাঁচে। তবে প্রতারকদের হাত থেকে বাঁচতে কখনোই কারও সঙ্গে পিন বা ওটিপি শেয়ার করা উচিত নয়।

Model answer: Mobile financial services are rapidly becoming popular in Bangladesh. Now even a farmer in a village can send and receive money through a mobile phone. This saves both time and money. However, to stay safe from fraudsters, one should never share one's PIN or OTP with anyone.

Practice 2 (Bangla → English): Cyber risk

সাম্প্রতিক বছরগুলোতে ব্যাংকিং খাতে সাইবার হামলার ঝুঁকি উল্লেখযোগ্যভাবে বেড়েছে। হ্যাকাররা ভুয়া ই-মেইল ও ওয়েবসাইটের মাধ্যমে গ্রাহকের তথ্য চুরির চেষ্টা করছে। তাই ব্যাংকগুলো নিরাপত্তাব্যবস্থা জোরদার করছে এবং কর্মীদের নিয়মিত প্রশিক্ষণ দিচ্ছে। গ্রাহকদেরও সচেতন হতে হবে।

Model answer: In recent years, the risk of cyber attacks in the banking sector has increased significantly. Hackers are trying to steal customers' information through fake e-mails and websites. Therefore, banks are strengthening their security systems and training their employees regularly. Customers must also be aware.

Practice 3 (Bangla → English): Remittance

প্রবাসী বাংলাদেশিদের পাঠানো রেমিট্যান্স দেশের অর্থনীতির অন্যতম চালিকাশক্তি। এই অর্থ বৈদেশিক মুদ্রার রিজার্ভ বাড়ায় এবং গ্রামীণ পরিবারগুলোর জীবনযাত্রার মান উন্নত করে। হুন্ডির পরিবর্তে বৈধ পথে টাকা পাঠাতে প্রবাসীদের উৎসাহিত করা প্রয়োজন।

Model answer: Remittances sent by expatriate Bangladeshis are one of the main driving forces of the country's economy. This money increases foreign exchange reserves and improves the living standards of rural families. Expatriates need to be encouraged to send money through legal channels instead of hundi.

Practice 4 (Bangla → English): Default loans

খেলাপি ঋণ ব্যাংকিং খাতের একটি দীর্ঘস্থায়ী সমস্যা। প্রভাবশালী ঋণগ্রহীতারা ঋণ পরিশোধ না করায় অনেক ব্যাংক তারল্য সংকটে পড়ছে। এ সমস্যা সমাধানে কঠোর আইন প্রয়োগ এবং ঋণ বিতরণে স্বচ্ছতা নিশ্চিত করা জরুরি।

Model answer: Non-performing loans are a long-standing problem in the banking sector. As influential borrowers do not repay their loans, many banks are facing a liquidity crisis. To solve this problem, it is urgent to enforce strict laws and ensure transparency in loan disbursement.

Practice 5 (English → Bangla): Agent banking

Agent banking has brought banking services to the doorsteps of rural people. Through an agent outlet, customers can open accounts, deposit and withdraw money, and receive remittances. As a result, they no longer need to travel long distances to visit a bank branch.

Model answer: এজেন্ট ব্যাংকিং গ্রামের মানুষের দোরগোড়ায় ব্যাংকিং সেবা পৌঁছে দিয়েছে। এজেন্ট আউটলেটের মাধ্যমে গ্রাহকেরা হিসাব খুলতে, টাকা জমা ও উত্তোলন করতে এবং রেমিট্যান্স গ্রহণ করতে পারেন। ফলে তাঁদের আর ব্যাংকের শাখায় যেতে দীর্ঘ পথ পাড়ি দিতে হয় না।

Practice 6 (English → Bangla): Security instruction

The bank has instructed all its branches to strengthen their information security systems. Every branch must change default passwords and keep regular backups of important data. Customers will be informed by SMS about any suspicious transaction.

Model answer: ব্যাংকটি তার সব শাখাকে তথ্য নিরাপত্তাব্যবস্থা জোরদার করার নির্দেশ দিয়েছে। প্রতিটি শাখাকে ডিফল্ট পাসওয়ার্ড পরিবর্তন করতে হবে এবং গুরুত্বপূর্ণ তথ্যের নিয়মিত ব্যাকআপ রাখতে হবে। যেকোনো সন্দেহজনক লেনদেন সম্পর্কে গ্রাহকদের এসএমএসের মাধ্যমে জানানো হবে।

Practice 7 (English → Bangla): Climate change

Bangladesh is one of the countries most affected by climate change. Every year, floods, cyclones and river erosion make thousands of people homeless. To face this challenge, we must plant more trees and use renewable energy.

Model answer: বাংলাদেশ জলবায়ু পরিবর্তনে সবচেয়ে ক্ষতিগ্রস্ত দেশগুলোর একটি। প্রতিবছর বন্যা, ঘূর্ণিঝড় ও নদীভাঙনে হাজার হাজার মানুষ গৃহহীন হয়। এই চ্যালেঞ্জ মোকাবিলায় আমাদের আরও বেশি গাছ লাগাতে হবে এবং নবায়নযোগ্য জ্বালানি ব্যবহার করতে হবে।

Practice 8 (English → Bangla): Inflation

Inflation has made life difficult for low- and fixed-income people. Prices of rice, oil and vegetables have risen, but incomes have not increased at the same rate. As a result, many families are cutting their daily expenses and savings.

Model answer: মূল্যস্ফীতি নিম্ন ও নির্দিষ্ট আয়ের মানুষের জীবন কঠিন করে তুলেছে। চাল, তেল ও সবজির দাম বেড়েছে, কিন্তু আয় সেই হারে বাড়েনি। ফলে অনেক পরিবার তাদের দৈনন্দিন খরচ ও সঞ্চয় কমাচ্ছে।

Practice 9 (English → Bangla): Artificial intelligence

Artificial intelligence is changing the way we live and work. In banks, chatbots now answer customers' questions at any time of the day. However, we must use this technology responsibly and protect personal data.

Model answer: কৃত্রিম বুদ্ধিমত্তা আমাদের জীবনযাপন ও কাজের ধরন বদলে দিচ্ছে। ব্যাংকে এখন চ্যাটবট দিনের যেকোনো সময় গ্রাহকদের প্রশ্নের উত্তর দিচ্ছে। তবে আমাদের এই প্রযুক্তি দায়িত্বশীলভাবে ব্যবহার করতে হবে এবং ব্যক্তিগত তথ্য সুরক্ষিত রাখতে হবে।

5.5.5 Proverbs and set expressions (asked as one-line items)

Bangla	English equivalent

খালি কলসি বাজে বেশি।	Empty vessels sound much.
দশের লাঠি একের বোঝা।	Many hands make light work.
অভাবে স্বভাব নষ্ট।	Necessity knows no law.
যত গর্জে তত বর্ষে না।	Barking dogs seldom bite.
সময়ের এক ফোঁড়, অসময়ের দশ ফোঁড়।	A stitch in time saves nine.
চকচক করলেই সোনা হয় না।	All that glitters is not gold.
অল্পবিদ্যা ভয়ংকরী।	A little learning is a dangerous thing.
ইচ্ছা থাকলে উপায় হয়।	Where there is a will, there is a way.
নাচতে না জানলে উঠান বাঁকা।	A bad workman quarrels with his tools.
দুষ্ট গরুর চেয়ে শূন্য গোয়াল ভালো।	Better an empty house than a bad tenant.

5.6 Common Mistakes in Written English

Wrong	Right	Rule
We discussed about the problem.	We discussed the problem.	*Discuss* takes no preposition.
People is using MFS.	People are using MFS.	*People* is plural.
The informations are correct.	The information is correct.	Uncountable: information, advice, equipment, news, furniture.
One of the bank have a problem.	One of the banks has a problem.	*One of the* + plural noun + singular verb.
Each of the customers have an account.	Each of the customers has an account.	*Each/every/either* → singular verb.
He is working here since 2020.	He has been working here since 2020.	*since/for* + continuing action → present perfect (continuous).
I am knowing the answer.	I know the answer.	Stative verbs (know, believe, own) are not used in continuous.
If I will get the job, I will …	If I get the job, I will …	No *will* in the *if*-clause (first conditional).
Despite of the rain …	Despite the rain … / In spite of the rain …	Never "despite of".
Although it is cheap, but it is risky.	Although it is cheap, it is risky.	Use either *although* or *but*.
He is an university teacher. / She is a honest officer.	He is a university teacher. / She is an honest officer.	*a* before consonant **sound** (a university, a one-time password); *an* before vowel sound (an hour, an MFS agent).

Bangladesh is a riverine country of the world.	Bangladesh is a riverine country.	Avoid empty fillers.
It is very very important.	It is extremely / vitally important.	No double intensifiers.
I am agree with you.	I agree with you.	*Agree* is a verb, not an adjective.
She is senior than me.	She is senior to me.	senior/junior/superior/inferior/prior + *to*.
He prefers tea than coffee.	He prefers tea to coffee.	*prefer A to B*.
The bank gave me a loan of Tk 50,000 taka.	The bank gave me a loan of Tk 50,000.	Do not repeat the currency.
Return back / revert back / repeat again	return / revert / repeat	Redundancy.
Myself Rafiq, working in IT.	I am Rafiq, and I work in IT.	"Myself" is not a subject (Banglish).
Kindly do the needful.	Please reverse the amount by Thursday.	State the exact action.
Its a secure system. / The bank and it's customers	It's (= it is) a secure system. / The bank and its customers	*its* = possessive; *it's* = it is.
The data was effected by the virus.	The data was affected by the virus.	*affect* (v) / *effect* (n).
Loose your password / Advice him	Lose your password / Advise him	Spelling pairs: lose–loose, advise (v)–advice (n), principal–principle, stationary–stationery.
Ten thousands people / Two lakhs taka	Ten thousand people / Tk 2 lakh	Number words after a number stay singular.
Cyber crime is increasing day by day in an alarming rate.	Cyber crime is increasing at an alarming rate.	*at* a rate; avoid cliché "day by day".

60-second proof-reading checklist

(1) Every sentence has a subject and a finite verb. (2) Subject–verb agreement. (3) Tense consistent throughout. (4) Articles a/an/the. (5) Spelling of key terms (receive, government, environment, transaction, guarantee, privilege). (6) Full stop and capital letter at sentence boundaries. (7) Word limit respected.

5.6.1 Quick practice (MCQ)

1. Choose the correct sentence.

(a) We discussed about the issue.
(b) We discussed the issue.
(c) We discussed on the issue.
(d) We have discussed about the issue.

Answer: (b) — *discuss* is transitive; no preposition.

2. ___ the poor network, the transfer was completed.

(a) Although
(b) Despite of
(c) In spite of
(d) Because of

Answer: (c) — *in spite of* + noun shows contrast; "despite of" is wrong; *although* needs a clause.

3. Which closing matches "Dear Sir/Madam,"?

(a) Yours sincerely,
(b) Yours faithfully,
(c) Cheers,
(d) Your obedient,

Answer: (b) — unnamed recipient → *Yours faithfully*.

4. Choose the correct form: "He ___ in this bank since 2019."

(a) works
(b) is working
(c) has been working
(d) worked

Answer: (c) — *since* + an action still continuing → present perfect continuous.

5. Choose the correct sentence (it started drizzling in the morning and is still drizzling).

(a) It is drizzling from morning.
(b) It has been drizzling since morning.
(c) It drizzles since morning.
(d) It was drizzling from the morning.

Answer: (b) — started in the past and still continuing → present perfect continuous with *since*.
BSCS AME/AE 24.01.2026

6. "Judicious" was given for sentence making. Which answer earns full marks?

(a) Judicious means wise.
(b) He spent the money judiciously.
(c) A judicious use of funds speeds up development.
(d) Judiciousness is good.

Answer: (c) — same word and part of speech, meaning clear from context. E · AP 17.01.2026

7. Choose the correct sentence.

(a) The informations are updated.
(b) The information are updated.
(c) The information is updated.
(d) An information is updated.

Answer: (c) — *information* is uncountable and singular.

8. Which linking word shows a result?

(a) However
(b) Consequently
(c) Although
(d) For instance

Answer: (b) — *consequently* = as a result.

Chapter 6 — Bangla: Grammar and Writing

বাংলা ব্যাকরণ, শব্দভান্ডার, সাহিত্য ও ফোকাস রাইটিং

Explanations are in English; the Bangla words, sentences and essays stay in Bangla because the exam asks them in Bangla. Spellings follow the Bangla Academy standard (প্রমিত বানান).

Where Bangla scores marks in bank IT exams

- **MCQ:** Combined Bank Officer (IT) and BSCS Officer (IT) MCQ papers had Bangla grammar items: সমাস, সন্ধি, এক কথায় প্রকাশ, বিপরীত শব্দ, পদ, যুক্তবর্ণ (see the past questions in each section).
- **Written:** Bangla Focus Writing 10 marks (SO IT / Officer IT 2026, BB AP 2023) and a Bangla essay (BSCS AP/Officer IT 03.01.2026); English→Bangla translation needs correct Bangla spelling.
- Highest return for little time: বানান, সমাস, সন্ধি, এক কথায় প্রকাশ, বাগধারা, then focus writing practice.

6.1 বানান — Spelling rules

ই / ঈ (i-kar / ii-kar)

Key rules (Bangla Academy)

1. **তৎসম** (Sanskrit-origin) words keep their original spelling: নীরব, মনীষী, পৃথিবী, শ্রদ্ধাঞ্জলি, বাল্মীকি. Where Sanskrit allows both ই and ঈ, Bangla Academy prefers ই: শ্রেণি, পদবি, ধমনি, তরণি.
2. **অতৎসম** words (তদ্ভব, দেশি, বিদেশি, মিশ্র) always take ই: সরকারি, তৈরি, বাড়ি, গাড়ি, পাখি, হাতি, দরকারি, বেআইনি.
3. Names of languages and nations take ই: বাঙালি, ইংরেজি, জাপানি, আরবি, হিন্দি.
4. Feminine forms of অতৎসম words take ই: রানি, কাকি, মাসি.
5. Sanskrit "-ইন্" words (মন্ত্রী, প্রাণী, যোগী, দায়ী) change ঈ → ই before -ত্ব, -তা or in a compound: মন্ত্রিত্ব, মন্ত্রিসভা, প্রাণিবিদ্যা, দায়িত্ব, প্রতিযোগিতা, সহযোগিতা.
6. **কি / কী:** yes/no question → কি (তুমি কি যাবে?); "what / how" as pronoun or adjective → কী (তুমি কী খাবে? কী সুন্দর!).
7. Exception to remember: ঈদ keeps ঈ.

উ / ঊ (u-kar / uu-kar)

Key rules

1. তৎসম words keep ঊ where Sanskrit has it: পূর্ব, মূল্য, ভূমি, মুহূর্ত, ঊর্ধ্ব, শুশ্রূষা, মুমূর্ষু, কটূক্তি.
2. অতৎসম words take উ: চুন, পুব, পুরো, ধুলো, মুলা.
3. **দূর vs দুর্:** দূর (far) has ঊ — দূরত্ব, দূরদর্শী, দূরবীক্ষণ. The prefix দুর্ (bad, difficult) has উ — দুর্নীতি, দুরবস্থা, দুর্যোগ, দুর্লভ, দুর্গম.

ণত্ব বিধান (when ন becomes ণ)

ণ-rules (only in তৎসম words)

1. After ঋ, র, ষ the dental ন becomes ণ: ঋণ, তৃণ, বর্ণ, কারণ, ভীষণ, তৃষ্ণা.
2. Even if a vowel, a ক-বর্গ or প-বর্গ letter, য, য়, হ or ং comes in between: শ্রবণ, গ্রহণ, ব্রাহ্মণ, অর্পণ, হরিণ, রামায়ণ, পরিণাম, প্রণাম.
3. With ট-বর্গ (ট ঠ ড ঢ) in a conjunct: ণ — ঘণ্টা, কণ্টক, কাণ্ড, লুণ্ঠন, খণ্ড.
4. With ত-বর্গ (ত থ দ ধ) in a conjunct: always ন — অন্ত, গ্রন্থ, ক্রন্দন, বন্ধন.
5. In a compound where the two words stay separate, no ণ: সর্বনাম, দুর্নীতি, দুর্নাম, ত্রিনয়ন, অগ্রনায়ক, পরনিন্দা.
6. Foreign words never take ণ: গভর্নর, জার্মানি, কেরানি, ফরমান, পরগনা.
7. Natural ণ (স্বভাবত ণ, just memorise): গণ, গুণ, মণি, বাণী, বাণিজ্য, লবণ, বীণা, কণা, পণ্য, পুণ্য, নিপুণ, কল্যাণ, লাবণ্য, বণিক, কোণ.

Trap — অপরাহ্ণ vs মধ্যাহ্ন

অপরাহ্ণ, পূর্বাহ্ণ take ণ (there is a র in অপর / পূর্ব). মধ্যাহ্ন, সায়াহ্ন take ন (no র).

ষত্ব বিধান (when স becomes ষ)

ষ-rules (only in তৎসম words)

1. After ঋ / ঋ-কার: ঋষি, কৃষক, বৃষ্টি, দৃষ্টি, তৃষ্ণা.
2. After র / রেফ: বর্ষা, বর্ষণ, হর্ষ, ঘর্ষণ, শীর্ষ.
3. With ট / ঠ in a conjunct: কষ্ট, নষ্ট, স্পষ্ট, ওষ্ঠ, কাষ্ঠ, নিষ্ঠা.
4. After prefixes ending in ই / উ (অভি, প্রতি, অনু, নি, বি, সু) in many words: অভিষেক, প্রতিষ্ঠান, অনুষ্ঠান, নিষেধ, বিষম, সুষমা. (Not all: অনুসন্ধান, বিসর্জন keep স.)
5. নিঃ, দুঃ, বহিঃ, আবিঃ + ক / প → ষ্ক / ষ্প: নিষ্কর, দুষ্কর, বহিষ্কার, আবিষ্কার, নিষ্পাপ, দুষ্প্রাপ্য.
6. The suffix "সাৎ" keeps স: ধূলিসাৎ, অগ্নিসাৎ, ভূমিসাৎ.
7. Foreign words keep স: স্টেশন, পোস্ট, মাস্টার, স্টোর.

যুক্তবর্ণ (conjunct letters) — often asked

যুক্তবর্ণ	ভাঙলে	উদাহরণ	যুক্তবর্ণ	ভাঙলে	উদাহরণ
ক্ষ	ক + ষ	শিক্ষা	জ্ঞ	জ + ঞ	জ্ঞান
ক্ষ্ণ	ক + ষ + ণ	তীক্ষ্ণ	ক্ষ্ম	ক + ষ + ম	লক্ষ্মী
ঙ্ক্ষ	ঙ + ক + ষ	আকাঙ্ক্ষা	ঞ্জ	ঞ + জ	অঞ্জলি
হ্ম	হ + ম	ব্রাহ্মণ	হ্ণ	হ + ণ	অপরাহ্ণ
হ্ন	হ + ন	চিহ্ন	ষ্ণ	ষ + ণ	কৃষ্ণ
ত্ত্ব	ত + ত + ব	সত্ত্ব	ন্ত্ব	ন + ত + ব	সান্ত্বনা

Past question Bank IT MCQ 2026

"তীক্ষ্ণ" শব্দের যুক্তবর্ণ "ক্ষ্ণ" কোন কোন বর্ণ দিয়ে গঠিত?

Answer: ক + ষ + ণ. (ক্ষ itself is ক + ষ; ণ comes because ষ precedes it — ণত্ব rule 1.)

শুদ্ধ / অশুদ্ধ বানান — 52 high-frequency pairs

অশুদ্ধ	শুদ্ধ	অশুদ্ধ	শুদ্ধ
অত্যাধিক	**অত্যধিক**	আকাংখা	**আকাঙ্ক্ষা**
ইতিপূর্বে	**ইতঃপূর্বে**	ইতিমধ্যে	**ইতোমধ্যে**
উজ্জল	**উজ্জ্বল**	উপরোক্ত	**উপর্যুক্ত**
উচ্ছাস	**উচ্ছ্বাস**	উচিৎ	**উচিত**
দূরাবস্থা	**দুরবস্থা**	দুর্নীতি	**দুর্নীতি**
দ্বন্দ	**দ্বন্দ্ব**	নিরব	**নীরব**
নিরোগ	**নীরোগ**	নিশিথ	**নিশীথ**
পুরষ্কার	**পুরস্কার**	পরিস্কার	**পরিষ্কার**
পিপিলিকা	**পিপীলিকা**	পৈত্রিক	**পৈতৃক**
প্রতিযোগীতা	**প্রতিযোগিতা**	প্রনাম	**প্রণাম**
প্রাণীবিদ্যা	**প্রাণিবিদ্যা**	বাল্মিকী	**বাল্মীকি**
বুদ্ধিজীবি	**বুদ্ধিজীবী**	ভৌগলিক	**ভৌগোলিক**
ভূবন	**ভুবন**	মনিষী	**মনীষী**
মন্ত্রীসভা	**মন্ত্রিসভা**	মরিচীকা	**মরীচিকা**
মুহুর্ত	**মুহূর্ত**	মুমূর্ষ	**মুমূর্ষু**
মনোকষ্ট	**মনঃকষ্ট**	লক্ষী	**লক্ষ্মী**
শারীরীক	**শারীরিক**	শ্রদ্ধাঞ্জলী	**শ্রদ্ধাঞ্জলি**
শুশ্রুষা	**শুশ্রূষা**	স্বরস্বতী	**সরস্বতী**
সন্যাসী	**সন্ন্যাসী**	সমিচীন	**সমীচীন**
সত্বেও	**সত্ত্বেও**	সাস্থ্য	**স্বাস্থ্য**
স্বান্তনা	**সান্ত্বনা**	সরকারী	**সরকারি**
তৈরী	**তৈরি**	বাঙালী	**বাঙালি**
কটুক্তি	**কটূক্তি**	তত্ব	**তত্ত্ব**
প্রজ্জ্বলন	**প্রজ্বলন**	স্নাতোকত্তর	**স্নাতকোত্তর**
গভর্ণর	**গভর্নর**	পোষ্ট	**পোস্ট**
আশীষ	**আশিস**	কৃতীত্ব	**কৃতিত্ব**

Shortcuts to choose the right spelling fast

- A word with a prefix ending in "ঃ" (ইতঃ, মনঃ, অন্তঃ, নিঃ) — look for the বিসর্গ or its sandhi form: ইতঃপূর্বে, মনঃকষ্ট, অন্তঃসত্ত্বা.
- "-ইক" adjectives lengthen the first vowel (বৃদ্ধি): ভূগোল → ভৌগোলিক, শরীর → শারীরিক, পিতৃ → পৈতৃক, ইতিহাস → ঐতিহাসিক.
- Do not double a suffix: দারিদ্র্য (not দারিদ্রতা), সৌজন্য (not সৌজন্যতা), ঐক্য (not ঐক্যতা), উৎকর্ষ (not উৎকর্ষতা).

6.2 সন্ধি — Sandhi (joining of sounds)

Three kinds: **স্বরসন্ধি** (vowel + vowel), **ব্যঞ্জনসন্ধি** (with a consonant), **বিসর্গসন্ধি** (with ঃ). Words formed irregularly are **নিপাতনে সিদ্ধ**. In the exam you are usually asked to split (সন্ধিবিচ্ছেদ) — write the two parts with "+".

স্বরসন্ধি

Rule	Examples
অ/আ + অ/আ = আ	হিম + আলয় = হিমালয়; বিদ্যা + আলয় = বিদ্যালয়; নর + অধম = নরাধম; দেব + আলয় = দেবালয়
ই/ঈ + ই/ঈ = ঈ	অতি + ইত = অতীত; পরি + ঈক্ষা = পরীক্ষা; রবি + ইন্দ্র = রবীন্দ্র; সতী + ঈশ = সতীশ
উ/ঊ + উ/ঊ = ঊ	মরু + উদ্যান = মরূদ্যান; বধূ + উৎসব = বধূৎসব; লঘু + ঊর্মি = লঘূর্মি
অ/আ + ই/ঈ = এ	নর + ইন্দ্র = নরেন্দ্র; মহা + ঈশ = মহেশ; গণ + ঈশ = গণেশ; যথা + ইষ্ট = যথেষ্ট
অ/আ + উ/ঊ = ও	সূর্য + উদয় = সূর্যোদয়; যথা + উচিত = যথোচিত; গঙ্গা + ঊর্মি = গঙ্গোর্মি
অ/আ + ঋ = অর্	দেব + ঋষি = দেবর্ষি; মহা + ঋষি = মহর্ষি; রাজ + ঋষি = রাজর্ষি
অ/আ + এ/ঐ = ঐ	জন + এক = জনৈক; সদা + এব = সদৈব; মহা + ঐশ্বর্য = মহৈশ্বর্য
অ/আ + ও/ঔ = ঔ	বন + ওষধি = বনৌষধি; মহা + ঔষধ = মহৌষধ
ই/ঈ + other vowel = য-ফলা	অতি + অন্ত = অত্যন্ত; ইতি + আদি = ইত্যাদি; প্রতি + এক = প্রত্যেক; অভি + উদয় = অভ্যুদয়
উ/ঊ + other vowel = ব-ফলা	সু + অল্প = স্বল্প; সু + আগত = স্বাগত; অনু + এষণ = অন্বেষণ
ঋ + other vowel = র-ফলা	পিতৃ + আলয় = পিত্রালয়; পিতৃ + আদেশ = পিত্রাদেশ
এ/ঐ/ও/ঔ + vowel = অয়/আয়/অব/আব	নে + অন = নয়ন; শে + অন = শয়ন; নৈ + অক = নায়ক; গৈ + অক = গায়ক; পো + অন = পবন; ভো + অন = ভবন; পৌ + অক = পাবক

ব্যঞ্জনসন্ধি

Rule	Examples
Class-1st letter + vowel / voiced letter → class-3rd letter	বাক্ + দান = বাগ্দান; দিক্ + অন্ত = দিগন্ত; জগৎ + ঈশ = জগদীশ; সৎ + উপায় = সদুপায়; ষট্ + আনন = ষড়ানন
Class-1st letter + ন/ম → class-5th letter	বাক্ + ময় = বাঙ্ময়; জগৎ + নাথ = জগন্নাথ; তৎ + মধ্যে = তন্মধ্যে; চিৎ + ময় = চিন্ময়; ষট্ + মাস = ষণ্মাস

ত/দ + চ/ছ → চ্চ/চ্ছ	উৎ + চারণ = উচ্চারণ; সৎ + চিন্তা = সচ্চিন্তা; উৎ + ছেদ = উচ্ছেদ
ত/দ + জ → জ্জ	সৎ + জন = সজ্জন; উৎ + জ্বল = উজ্জ্বল; বিপদ্ + জাল = বিপজ্জাল
ত/দ + শ → চ্ছ	উৎ + শ্বাস = উচ্ছ্বাস; চলৎ + শক্তি = চলচ্ছক্তি
ত/দ + হ → দ্ধ	উৎ + হার = উদ্ধার; তৎ + হিত = তদ্ধিত; পদ্ + হতি = পদ্ধতি
ত/দ + ল → ল্ল	উৎ + লাস = উল্লাস; উৎ + লেখ = উল্লেখ
ম + ক–ম (stop) → ং or nasal of that class	সম্ + কল্প = সংকল্প; সম্ + গীত = সংগীত; কিম্ + কর = কিংকর
ম + য র ল ব শ ষ স হ → ং	সম্ + যম = সংযম; সম্ + বাদ = সংবাদ; সম্ + সার = সংসার; সম্ + হার = সংহার; সম্ + রক্ষণ = সংরক্ষণ
vowel + ছ → চ্ছ	পরি + ছেদ = পরিচ্ছেদ; বি + ছেদ = বিচ্ছেদ; এক + ছত্র = একচ্ছত্র

বিসর্গসন্ধি

Rule	Examples
অঃ + voiced consonant / অ → ও	মনঃ + যোগ = মনোযোগ; মনঃ + রম = মনোরম; তিরঃ + ধান = তিরোধান; যশঃ + দা = যশোদা; বয়ঃ + বৃদ্ধ = বয়োবৃদ্ধ; ততঃ + অধিক = ততোধিক
র-জাত বিসর্গ (নিঃ, দুঃ, অন্তঃ, পুনঃ, বহিঃ, আবিঃ) + vowel / voiced → র্	নিঃ + আকার = নিরাকার; দুঃ + যোগ = দুর্যোগ; অন্তঃ + গত = অন্তর্গত; পুনঃ + আয় = পুনরায়; নিঃ + জন = নির্জন; আবিঃ + ভাব = আবির্ভাব; দুঃ + নীতি = দুর্নীতি
ঃ + চ/ছ → শ	নিঃ + চয় = নিশ্চয়; নিঃ + চল = নিশ্চল; দুঃ + চরিত্র = দুশ্চরিত্র; শিরঃ + ছেদ = শিরশ্ছেদ
ঃ + ট/ঠ → ষ	ধনুঃ + টংকার = ধনুষ্টংকার; নিঃ + ঠুর = নিষ্ঠুর
ঃ + ত/থ → স	দুঃ + তর = দুস্তর; নিঃ + তেজ = নিস্তেজ; মনঃ + তাপ = মনস্তাপ
ইঃ/উঃ + ক/প/ফ → ষ	নিঃ + কাম = নিষ্কাম; দুঃ + কর = দুষ্কর; বহিঃ + কার = বহিষ্কার; নিঃ + পাপ = নিষ্পাপ; নিঃ + ফল = নিষ্ফল
অঃ + ক/প → স	নমঃ + কার = নমস্কার; পুরঃ + কার = পুরস্কার; তিরঃ + কার = তিরস্কার

নিপাতনে সিদ্ধ (irregular — memorise)

গো + অক্ষ = গবাক্ষ · বৃহৎ + পতি = বৃহস্পতি · পতৎ + অঞ্জলি = পতঞ্জলি · এক + দশ = একাদশ · তৎ + কর = তস্কর · মনস্ + ঈষা = মনীষা · পর + পর = পরস্পর · বন + পতি = বনস্পতি · আ + চর্য = আশ্চর্য · গো + পদ = গোষ্পদ · ষট্ + দশ = ষোড়শ

খাঁটি বাংলা সন্ধি: শত + এক = শতেক · মিথ্যা + উক = মিথ্যুক · যা + ইচ্ছা + তাই = যাচ্ছেতাই

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"পরীক্ষা" শব্দের সন্ধিবিচ্ছেদ কোনটি?

Answer: পরি + ঈক্ষা. Rule: ই + ঈ = ঈ (স্বরসন্ধি). Trap options like "পরী + ক্ষা" or "পরি + ক্ষা" are wrong because the second word is ঈক্ষা (seeing).

Common traps

- উচ্ছ্বাস = উৎ + শ্বাস (not উৎ + ছ্বাস). উজ্জ্বল = উৎ + জ্বল.
- দুর্নীতি = দুঃ + নীতি (বিসর্গসন্ধি), not দুর + নীতি.
- বৃহস্পতি and আশ্চর্য are নিপাতনে সিদ্ধ — do not force a regular rule.

6.3 সমাস — Compounds

সমাস joins two or more meaningful words into one. The words that explain the compound form the **ব্যাসবাক্য** (বিগ্রহবাক্য). Exam questions: "কোন সমাস?" or "ব্যাসবাক্য লেখো". The six traditional types:

How to identify (which word's meaning dominates)

- **দ্বন্দ্ব** — both words equally (joined by ও / এবং).
- **কর্মধারয়** — the latter word; the former is its adjective / comparison (যে... সে, ন্যায়, রূপ).
- **তৎপুরুষ** — the latter word; the former loses a case-ending (কে, দ্বারা, জন্য, থেকে, র, এ).
- **বহুব্রীহি** — neither word; a third thing is meant (যার, যে).
- **দ্বিগু** — first word is a number, meaning a collection (সমাহার).
- **অব্যয়ীভাব** — first word is an indeclinable / prefix (আ, উপ, প্রতি, যথা, নির্) and dominates.

সমাস	ব্যাসবাক্য → সমস্তপদ
দ্বন্দ্ব	মা ও বাবা = মা-বাবা; ভাই ও বোন = ভাইবোন; আয় ও ব্যয় = আয়-ব্যয়; জমা ও খরচ = জমাখরচ; দেশ ও বিদেশ = দেশবিদেশ; দুধে ও ভাতে = দুধেভাতে (অলুক দ্বন্দ্ব); হাটে ও বাজারে = হাটেবাজারে (অলুক দ্বন্দ্ব)
কর্মধারয়	নীল যে পদ্ম = নীলপদ্ম; যিনি রাজা তিনিই ঋষি = রাজর্ষি; সিংহ চিহ্নিত আসন = সিংহাসন (মধ্যপদলোপী); স্মৃতি রক্ষার্থে সৌধ = স্মৃতিসৌধ (মধ্যপদলোপী); তুষারের ন্যায় শুভ্র = তুষারশুভ্র (উপমান); কাজলের মতো কালো = কাজলকালো (উপমান); পুরুষ সিংহের ন্যায় = পুরুষসিংহ (উপমিত); মুখ চন্দ্রের ন্যায় = মুখচন্দ্র (উপমিত); বিষাদ রূপ সিন্ধু = বিষাদসিন্ধু (রূপক); জ্ঞান রূপ আলোক = জ্ঞানালোক (রূপক)
তৎপুরুষ	দুঃখকে প্রাপ্ত = দুঃখপ্রাপ্ত (দ্বিতীয়া); মন দিয়ে গড়া = মনগড়া (তৃতীয়া); বিয়ের জন্য পাগলা = বিয়েপাগলা (চতুর্থী); বিলাত থেকে ফেরত = বিলাতফেরত (পঞ্চমী); রাজার পুত্র = রাজপুত্র (ষষ্ঠী); গাছে পাকা = গাছপাকা (সপ্তমী); ন আচার = অনাচার (নঞ্ তৎপুরুষ); জলে চরে যে = জলচর (উপপদ); পঙ্কে জন্মে যা = পঙ্কজ (উপপদ); ঘোড়ার ডিম = ঘোড়ার ডিম (অলুক)
বহুব্রীহি	নীল কণ্ঠ যার = নীলকণ্ঠ; দশ আনন যার = দশানন; মহান আত্মা যার = মহাত্মা; বীণা পাণিতে যার = বীণাপাণি; নেই লজ্জা যার = নির্লজ্জ (নঞর্থক); সহ উদর যার = সহোদর (সহার্থক); কানে কলম যার = কানে কলম (অলুক); গায়ে হলুদ দেওয়া হয় যে অনুষ্ঠানে = গায়েহলুদ (অলুক); হাতে হাতে যে যুদ্ধ = হাতাহাতি (ব্যতিহার); লাঠিতে লাঠিতে যে যুদ্ধ = লাঠালাঠি (ব্যতিহার)
দ্বিগু	তিন কালের সমাহার = ত্রিকাল; শত অব্দের সমাহার = শতাব্দী; সপ্ত অহের সমাহার = সপ্তাহ; পঞ্চ বটের সমাহার = পঞ্চবটী; তিন মাথার সমাহার = তেমাথা; চার রাস্তার সমাহার = চৌরাস্তা; তিন পায়ার সমাহার = তেপায়া
অব্যয়ীভাব	মরণ পর্যন্ত = আমরণ; জানু পর্যন্ত = আজানু; দিন দিন = প্রতিদিন; কূলের সমীপে = উপকূল; গ্রহের সদৃশ = উপগ্রহ; বনের সদৃশ = উপবন; ভিক্ষার অভাব = দুর্ভিক্ষ; শক্তিকে অতিক্রম না করে = যথাশক্তি; জনের অভাব = নির্জন

Past questions Bank IT MCQ 2026

(i) "কানে কলম" কোন সমাস? — **অলুক বহুব্রীহি.** ব্যাসবাক্য: কানে কলম যার. It means a forgetful person (a third person), so বহুব্রীহি; the case-ending "-এ" of কানে stays (does not drop), so অলুক.
(ii) "নীলপদ্ম" কোন সমাস? — **কর্মধারয়.** ব্যাসবাক্য: নীল যে পদ্ম. নীল is an adjective of পদ্ম and the meaning of পদ্ম dominates.

Traps

- নীলকণ্ঠ (Shiva — a third person) is বহুব্রীহি, but নীলপদ্ম is কর্মধারয়. Ask: does the word mean a third person/thing?
- উপমান vs উপমিত: in উপমান the common quality word is present (তুষারশুভ্র — শুভ্র); in উপমিত it is absent (মুখচন্দ্র).
- অলুক = the case-ending (এ, র) does not drop: দুধেভাতে, ঘোড়ার ডিম, গায়েহলুদ, কানে কলম.

6.4 পদ, কারক ও বিভক্তি — Parts of speech, case and case-endings

পদ is a word used in a sentence with its বিভক্তি (বিভক্তিযুক্ত শব্দই পদ). **কারক** is the relation of a noun or pronoun to the verb (ক্রিয়ার সঙ্গে নামপদের সম্পর্ক), and **বিভক্তি** is the ending (-এ, -কে, -র, -তে) that marks that relation. To find কারক, always put a question to the verb.

পদ (5 parts of speech in Bangla)

পদ	Meaning	উদাহরণ
বিশেষ্য	noun	ঢাকা, নদী, সততা, সভা
বিশেষণ	adjective / adverb (qualifies another word)	সারা দেশ, নীল আকাশ, ধীরে চলো
সর্বনাম	pronoun	আমি, সে, তিনি, যে, কে
ক্রিয়া	verb	যাবে, পড়ছি, খেয়েছিল
অব্যয়	indeclinable (never changes)	না, এবং, কিন্তু, হায়, যদি

Worked example — ask the verb a question

রহিম ব্যাংক থেকে টাকা তুলে গরিবকে দান করল।

কে দান করল? → **রহিম** = কর্তৃকারকে শূন্য বিভক্তি.

কী তুলল? → **টাকা** = কর্মকারকে শূন্য বিভক্তি.

কোথা থেকে তুলল? → **ব্যাংক থেকে** = অপাদান কারকে পঞ্চমী ("থেকে").

কাকে দান করল (ownership given up for good)? → **গরিবকে** = সম্প্রদান কারকে চতুর্থী ("কে").

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(i) "সে এখন যাবে না" — "না" কোন পদ? — **অব্যয়** (না-বোধক অব্যয়); it never changes form.

(ii) "সারা দেশ" — "সারা" কোন পদ? — **বিশেষণ**; it qualifies the noun দেশ (how much of the country — all of it).

কারক (6) — find it by asking the verb a question

কারক	Question to the verb	উদাহরণ (কারক পদ bold)	বিভক্তি
কর্তৃকারক	কে / কারা?	**ছেলেরা** ফুটবল খেলে · **পাগলে** কী না বলে	শূন্য · সপ্তমী (এ)
কর্মকারক	কী / কাকে?	**ডাক্তার** ডাকো · **শিক্ষককে** শ্রদ্ধা করো	শূন্য · দ্বিতীয়া (কে)
করণকারক	কী দিয়ে / কীসের দ্বারা?	**কলম দিয়ে** লেখো · **টাকায়** কী না হয়	তৃতীয়া · সপ্তমী

সম্প্রদান	কাকে দান (ownership given up)?	**ভিখারিকে** ভিক্ষা দাও · **সৎপাত্রে** কন্যা দান করো	চতুর্থী · সপ্তমী
অপাদান	কোথা থেকে / কী থেকে?	**গাছ থেকে** পাতা পড়ে · **তিলে** তৈল হয়	পঞ্চমী · সপ্তমী
অধিকরণ	কোথায় / কখন?	**পুকুরে** মাছ আছে · **তিলে** তৈল আছে · **প্রভাতে** সূর্য ওঠে	সপ্তমী

Traps examiners love

- "তিলে তৈল **হয়**" = অপাদানে সপ্তমী (oil comes *from* sesame); "তিলে তৈল **আছে**" = অধিকরণে সপ্তমী (oil is *in* sesame).
- "ধোপাকে কাপড় দাও" = কর্মকারক (cloth is not given away for good); "ভিখারিকে ভিক্ষা দাও" = সম্প্রদান (ownership given up).
- সম্বন্ধ পদ (রাজার, আমার) and সম্বোধন পদ (ওহে, বন্ধু!) are **not** কারক — they are not directly linked to the verb.
- বিভক্তি names: প্রথমা (শূন্য/এ), দ্বিতীয়া (কে/রে), তৃতীয়া (দ্বারা/দিয়ে), চতুর্থী (কে/রে, for সম্প্রদান), পঞ্চমী (থেকে/হতে), ষষ্ঠী (র/এর), সপ্তমী (এ/য়/তে).

6.5 প্রকৃতি-প্রত্যয় — Root and suffix

A word = **প্রকৃতি** (root/base) + **প্রত্যয়** (suffix). Verb root (ধাতু) + suffix = **কৃৎ প্রত্যয়**; noun/adjective base + suffix = **তদ্ধিত প্রত্যয়**. Verb roots are marked with √ or written with হসন্ত: √পঠ্, √গম্, √দৃশ্.

শব্দ	প্রকৃতি + প্রত্যয়	শব্দ	প্রকৃতি + প্রত্যয়
সংস্কৃত কৃৎ প্রত্যয়			
পাঠক	পঠ্ + অক	লেখক	লিখ্ + অক
নায়ক	নী + অক	গায়ক	গৈ + অক
গন্তব্য	গম্ + তব্য	কর্তব্য	কৃ + তব্য
করণীয়	কৃ + অনীয়	পূজনীয়	পূজ্ + অনীয়
স্মরণীয়	স্মৃ + অনীয়	দর্শনীয়	দৃশ্ + অনীয়
গত	গম্ + ক্ত	দৃষ্ট	দৃশ্ + ক্ত
কৃত	কৃ + ক্ত	উক্তি	বচ্ + ক্তি
বাংলা কৃৎ প্রত্যয়			
চলন্ত	চল্ + অন্ত	ঝুলন্ত	ঝুল্ + অন্ত
ডুবুরি	ডুব্ + উরি	পড়ুয়া	পড়্ + উয়া
ঢাকনা	ঢাক্ + অনা	জানা	জান্ + আ
তদ্ধিত প্রত্যয়			
সামাজিক	সমাজ + ইক	দৈনিক	দিন + ইক
ধার্মিক	ধর্ম + ইক	ঐতিহাসিক	ইতিহাস + ইক
মাধুর্য	মধুর + য	সৌন্দর্য	সুন্দর + য
ধনী	ধন + ইন্	গুণী	গুণ + ইন্

ঢাকাই	ঢাকা + আই	পাগলামি	পাগল + আমি
বোকামি	বোকা + আমি	দুধওয়ালা	দুধ + ওয়ালা

Shortcut

-ইক, -য তদ্ধিত suffixes lengthen the first vowel: সমাজ → সামাজিক, দিন → দৈনিক, মধুর → মাধুর্য, সুন্দর → সৌন্দর্য. This is also why ভৌগোলিক and শারীরিক are spelled that way (6.1).

Worked example — split, then decide কৃৎ or তদ্ধিত

Step 1: split the word into base + suffix. Step 2: if the base is a verb root (an action), it is কৃৎ; if it is a noun or adjective, it is তদ্ধিত.

গায়ক = √গৈ + ণক → base is an action (গাওয়া) ⇒ **কৃৎ প্রত্যয়**.

নাবিক = নৌ + ষ্ণিক → base is a noun (নৌকা) ⇒ **তদ্ধিত প্রত্যয়**; the ণ/ষ marker drops and changes the vowel.

মিতালি = মিতা + আলি → noun base, Bangla suffix ⇒ **বাংলা তদ্ধিত প্রত্যয়**.

6.6 উপসর্গ — Prefixes

উপসর্গ (prefix) sits before a word and changes, extends or reverses its meaning. Because one root can take many prefixes, a single root like হার gives a whole family of words with different meanings — this is the most common way the topic is examined.

Key facts

- উপসর্গ has no meaning on its own, but changes or extends the meaning of a word (অর্থদ্যোতকতা আছে, নিজস্ব অর্থ নেই).
- Bangla has **21 খাঁটি বাংলা** উপসর্গ and **20 তৎসম** (Sanskrit) উপসর্গ, plus বিদেশি (ফারসি, আরবি, ইংরেজি).
- Prefixes added to a **নাম শব্দ** or **ধাতু**; they come before the word.

Group	উপসর্গ	উদাহরণ
বাংলা (21)	অ, অঘা, অজ, অনা, আ, আড়, আন, আব, ইতি, উন (ঊন), কদ, কু, নি, পাতি, বি, ভর, রাম, স, সা, সু, হা	অঘামারা, অজপাড়াগাঁ, অনাবৃষ্টি, আধোয়া, আড়চোখে, আনমনা, কুনজর, নিখুঁত, পাতিহাঁস, ভরপেট, রামছাগল, সজোর, সাজোয়ান, সুনজর, হাভাতে
তৎসম (20)	প্র, পরা, অপ, সম্, নি, অব, অনু, নির্, দুর্, বি, অধি, সু, উৎ, পরি, প্রতি, অতি, অপি, অভি, উপ, আ	প্রগতি, পরাজয়, অপমান, সম্মান, নিবাস, অবনতি, অনুকরণ, নির্ভয়, দুর্গম, বিজ্ঞান, অধিপতি, সুনাম, উৎপাত, পরিপূর্ণ, প্রতিদিন, অতিরিক্ত, অভিযান, উপকূল, আজীবন
ফারসি	কার, না, নিম, বদ, বে, বর, কম, ফি	কারখানা, নারাজ, নিমরাজি, বদমেজাজ, বেহায়া, বেআদব, বরখাস্ত, কমজোর, ফি-বছর
আরবি	আম, খাস, লা, গর	আমজনতা, খাসমহল, লাপাত্তা, গরহাজির, গরমিল
ইংরেজি	হেড, সাব, ফুল, হাফ	হেডমাস্টার, সাব-রেজিস্ট্রার, ফুলহাতা, হাফহাতা

Worked example — one root, many meanings

Root word **হার** (√হৃ + ঘঞ্):

আহার = খাওয়া · **বি**হার = ভ্রমণ · **প্র**হার = মার · **উপ**হার = দান/উপঢৌকন · **পরি**হার = ত্যাগ · **সং**হার = বধ.

The root stays the same; only the উপসর্গ changes the meaning — so উপসর্গের **অর্থদ্যোতকতা** আছে, নিজস্ব অর্থ নেই.

Trap

অ, আ, নি, বি, সু appear in both the বাংলা and তৎসম lists — decide by the word: a তৎসম prefix joins a তৎসম word (বিজ্ঞান, সুগন্ধ), a বাংলা prefix joins a বাংলা word (আধোয়া, সুনজর). "অনাচার" is ন + আচার (নঞ্ তৎপুরুষ), not the prefix অনা.

6.7 বাগধারা — Idioms

A **বাগধারা** is a fixed group of words whose meaning differs from the literal words. MCQs ask the meaning; written papers ask you to use it in a sentence. In a sentence, keep the idiom unchanged and make the context show its meaning clearly.

বাগধারা	অর্থ (বাংলা)	Meaning (English)
অকাল কুষ্মাণ্ড	অপদার্থ	a good-for-nothing
অগস্ত্য যাত্রা	চিরদিনের জন্য প্রস্থান	leaving for ever
অন্ধের যষ্টি	একমাত্র অবলম্বন	the only support
অমাবস্যার চাঁদ	দুর্লভ বস্তু / কালেভদ্রে দেখা	something rarely seen
অরণ্যে রোদন	নিষ্ফল আবেদন	a cry in the wilderness, useless appeal
অক্কা পাওয়া	মারা যাওয়া	to die
অর্ধচন্দ্র	গলাধাক্কা	throwing out by the neck
আকাশকুসুম	অসম্ভব কল্পনা	castles in the air
আদায় কাঁচকলায়	শত্রুতা	bitter enmity
আঙুল ফুলে কলাগাছ	হঠাৎ বড়লোক	an upstart, sudden riches
ইঁচড়ে পাকা	অকালপক্ক	precocious
উভয় সংকট	দুই দিকেই বিপদ	a dilemma
উলুবনে মুক্তা ছড়ানো	অপাত্রে মূল্যবান বস্তু দান	casting pearls before swine
এক ক্ষুরে মাথা মোড়ানো	একই স্বভাবের	birds of a feather
কই মাছের প্রাণ	যা সহজে মরে না	very hard to kill, tenacious
কাঁঠালের আমসত্ত্ব	অসম্ভব বস্তু	an impossible thing
কাছা ঢিলা	অসাবধান	careless
কূপমণ্ডূক	সীমিত জ্ঞানের ঘরকুনো লোক	a frog in the well, narrow-minded
কেঁচো খুঁড়তে সাপ	সামান্য থেকে বড় বিপদ	small search reveals big trouble

খয়ের খাঁ	তোষামোদকারী	a flatterer
গোবর গণেশ	মূর্খ	a blockhead
গোঁফ খেজুরে	নিতান্ত অলস	extremely lazy
গোকুলের ষাঁড়	স্বেচ্ছাচারী	a self-willed, unrestrained person
গোড়ায় গলদ	শুরুতেই ভুল	a mistake at the root
ঘোড়ার ডিম	অবাস্তব / কিছুই না	nothing at all
চোখের বালি	চক্ষুশূল	an eyesore
চাঁদের হাট	গুণীজনের সমাবেশ	a gathering of brilliant people
ঠোঁট কাটা	স্পষ্টভাষী / বেহায়া	outspoken, brazen
ঢাকের কাঠি	চাটুকার	a sycophant
ঢাক ঢাক গুড় গুড়	গোপন রাখার চেষ্টা	trying to hush something up
তাসের ঘর	ক্ষণস্থায়ী বস্তু	a house of cards
তুলসী বনের বাঘ	ভণ্ড	a hypocrite
দুধের মাছি	সুসময়ের বন্ধু	a fair-weather friend
ধরি মাছ না ছুঁই পানি	কৌশলে কাজ সারা	getting things done without getting involved
ননীর পুতুল	শ্রমবিমুখ / অতি কোমল	a pampered, delicate person
পটল তোলা	মারা যাওয়া	to die
বিড়াল তপস্বী	ভণ্ড	a hypocrite
ব্যাঙের সর্দি	অসম্ভব ঘটনা	an impossible event
ভিজে বিড়াল	কপটচারী	a wolf in sheep's clothing
মণিকাঞ্চন যোগ	উপযুক্ত মিলন	a perfect match
মাছের মায়ের পুত্রশোক	কপট দুঃখ প্রকাশ	crocodile tears
যক্ষের ধন	কৃপণের ধন	a miser's hoarded wealth
রাজযোটক	উত্তম মিলন	an ideal union
লেফাফা দুরস্ত	বাইরের ঠাটবাট	outwardly smart
শাঁখের করাত	উভয় সংকট	a double-edged dilemma
সাপে নেউলে	চিরশত্রুতা	mortal enemies
হরিহর আত্মা	গভীর বন্ধুত্ব	bosom friends
হাতের পাঁচ	শেষ সম্বল	the last resort

Worked example — using an idiom in a sentence

অকাল কুষ্মাণ্ড (অপদার্থ) → লেখাপড়া না করে ছেলেটি একটা **অকাল কুষ্মাণ্ড** হয়ে উঠেছে।
অগস্ত্য যাত্রা (চিরদিনের জন্য প্রস্থান) → বিদেশে চাকরি নিয়ে সে যেন **অগস্ত্য যাত্রা** করল; আর কখনো গ্রামে ফেরেনি।
Never translate the idiom literally ("কুমড়া") — that loses the mark.

6.8 এক কথায় প্রকাশ — One-word substitution

এক কথায় প্রকাশ (বাক্য সংকোচন) replaces a phrase with a single word. Many answers are built by সমাস or প্রত্যয়, so knowing the pattern lets you work out items you have not memorised.

বাক্যাংশ	এক কথায়	বাক্যাংশ	এক কথায়
অক্ষির সম্মুখে / অভিমুখে	**প্রত্যক্ষ**	অক্ষির অগোচরে	**পরোক্ষ**
যা পূর্বে দেখা যায়নি	**অদৃষ্টপূর্ব**	যা পূর্বে শোনা যায়নি	**অশ্রুতপূর্ব**
যা পূর্বে ঘটেনি	**অভূতপূর্ব**	যা পূর্বে ছিল, এখন নেই	**ভূতপূর্ব**
যা চিন্তা করা যায় না	**অচিন্তনীয়**	যা বর্ণনা করা যায় না	**অবর্ণনীয়**
যা বলা হয়নি	**অনুক্ত**	যা বলা উচিত নয়	**অবাচ্য**
যা নিবারণ করা কষ্টকর	**দুর্নিবার**	যা দমন করা যায় না	**অদম্য**
যা জয় করা যায় না	**অজেয়**	যা সহজে লাভ করা যায় না	**দুর্লভ**
যা সাধন করা কঠিন	**দুঃসাধ্য**	যা আঘাত পায়নি	**অক্ষত**
মৃত্যু পর্যন্ত	**আমৃত্যু**	জানু পর্যন্ত লম্বিত	**আজানুলম্বিত**
যা ক্রমশ বাড়ছে	**বর্ধিষ্ণু**	যা ক্রমশ ক্ষয় পাচ্ছে	**ক্ষয়িষ্ণু**
মুক্তি পেতে ইচ্ছুক	**মুমুক্ষু**	মৃত্যু আসন্ন যার	**মুমূর্ষু**
জয় করার ইচ্ছা	**জিগীষা**	বেঁচে থাকার ইচ্ছা	**জিজীবিষা**
জানার ইচ্ছা	**জিজ্ঞাসা**	ক্ষমার যোগ্য	**ক্ষমার্হ**
যে বেশি কথা বলে	**বাচাল**	যে কম কথা বলে	**মিতভাষী**
যিনি বক্তৃতায় পটু	**বাগ্মী**	যে নিজেকে পণ্ডিত মনে করে	**পণ্ডিতম্মন্য**
উপকারীর অপকার করে যে	**কৃতঘ্ন**	উপকারীর উপকার স্বীকার করে যে	**কৃতজ্ঞ**
যে নারীর স্বামী বিদেশে থাকে	**প্রোষিতভর্তৃকা**	যে নারী বীর সন্তান প্রসব করে	**বীরপ্রসূ**
যার স্ত্রী মারা গেছে	**বিপত্নীক**	যে নারী সূর্য দেখেনি	**অসূর্যম্পশ্যা**
যে গাছ অন্য গাছে জন্মায়	**পরগাছা**	ফল পাকলে যে গাছ মরে যায়	**ওষধি**
ফুল ছাড়াই যে গাছে ফল ধরে	**বনস্পতি**	আকাশ ও পৃথিবী	**ক্রন্দসী**
নদী যেখানে সাগরে মেশে	**মোহনা**	যা খুব শীতল বা উষ্ণ নয়	**নাতিশীতোষ্ণ**
যা দীর্ঘ নয়	**নাতিদীর্ঘ**	অনেকের মধ্যে একজন	**অন্যতম**
ঈশ্বরে বিশ্বাস নেই যার	**নাস্তিক**	শত্রুকে দমন করে যে	**অরিন্দম**
যা উড়ে যাচ্ছে	**উড্ডীয়মান**	একবার শুনেই মনে রাখতে পারে যে	**শ্রুতিধর**
যা পান করা যায়	**পেয়**	যা চিবিয়ে খেতে হয়	**চর্ব্য**
যা চুষে খেতে হয়	**চোষ্য**	যা লেহন করে খেতে হয়	**লেহ্য**

Worked example — spot the pattern

যা পূর্বে দেখা যায়নি → অ (না) + দৃষ্ট (দেখা) + পূর্ব (আগে) = **অদৃষ্টপূর্ব**; the same pattern gives অশ্রুতপূর্ব (not heard before).

"...করার ইচ্ছা" (সন্ প্রত্যয়): পান করার ইচ্ছা = **পিপাসা** · ভোজনের ইচ্ছা = **বুভুক্ষা** · জানার ইচ্ছা = **জিজ্ঞাসা** · জয় করার ইচ্ছা = **জিগীষা**.

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"অক্ষির অভিমুখে" — এক কথায় কী হয়? — **প্রত্যক্ষ** (প্রতি + অক্ষ: before the eyes, i.e. direct). Its opposite, "অক্ষির অগোচরে", is **পরোক্ষ** (indirect).

6.9 সমার্থক ও বিপরীত শব্দ — Synonyms and antonyms

সমার্থক শব্দ share one meaning; **বিপরীত শব্দ** give the opposite meaning. Many antonyms are made with a negative or opposite prefix (অ, অন্, নি, নির্, দুর্, বি, অপ), so learn the pattern instead of only the list.

সমার্থক শব্দ (33)

শব্দ	সমার্থক	শব্দ	সমার্থক
অগ্নি	অনল, পাবক, বহ্নি, হুতাশন	আকাশ	গগন, অম্বর, নভঃ, ব্যোম
চন্দ্র	শশী, সুধাংশু, হিমাংশু, নিশাকর	সূর্য	রবি, ভানু, তপন, দিবাকর, ভাস্কর
জল / পানি	বারি, সলিল, নীর, অম্বু, উদক	পৃথিবী	ধরা, ধরিত্রী, বসুন্ধরা, মেদিনী, অবনী
বায়ু	পবন, সমীরণ, অনিল, মারুত	সমুদ্র	সাগর, জলধি, সিন্ধু, অর্ণব, রত্নাকর
পর্বত	অচল, অদ্রি, গিরি, শৈল, ভূধর	নদী	তটিনী, তরঙ্গিণী, স্রোতস্বিনী, প্রবাহিণী
মেঘ	জলদ, জলধর, বারিদ, নীরদ, পয়োদ	রাত্রি	নিশা, রজনী, যামিনী, শর্বরী, বিভাবরী
দিন	দিবা, দিবস, অহ	পদ্ম	কমল, শতদল, পঙ্কজ, সরোজ, রাজীব
হাতি	হস্তী, গজ, করী, মাতঙ্গ, কুঞ্জর	ঘোড়া	অশ্ব, ঘোটক, তুরঙ্গ, বাজি
সিংহ	কেশরী, পশুরাজ, মৃগরাজ, মৃগেন্দ্র	পাখি	পক্ষী, বিহগ, বিহঙ্গ, খেচর, দ্বিজ
বন	অরণ্য, কানন, বিপিন, অটবী	গাছ	বৃক্ষ, তরু, বিটপী, পাদপ, মহীরুহ
ফুল	পুষ্প, কুসুম, প্রসূন	চুল	কেশ, কুন্তল, চিকুর, অলক
চোখ	চক্ষু, নয়ন, লোচন, নেত্র, অক্ষি	মুখ	আনন, বদন
হাত	হস্ত, কর, পাণি, বাহু	স্ত্রী	পত্নী, ভার্যা, জায়া, সহধর্মিণী
স্বামী	পতি, ভর্তা, বর	পুত্র	সুত, তনয়, আত্মজ, নন্দন
কন্যা	সুতা, তনয়া, আত্মজা, দুহিতা, নন্দিনী	বিদ্যুৎ	তড়িৎ, বিজলি, সৌদামিনী, ক্ষণপ্রভা
সোনা	স্বর্ণ, কনক, কাঞ্চন, হেম, হিরণ্য	বন্ধু	সখা, সুহৃদ, মিত্র, বান্ধব
শত্রু	অরি, রিপু, বৈরী, অমিত্র	ইচ্ছা	অভিলাষ, বাসনা, কামনা, স্পৃহা
দেবতা	অমর, সুর, দেব		

বিপরীত শব্দ (36)

শব্দ	বিপরীত	শব্দ	বিপরীত	শব্দ	বিপরীত
প্রত্যয়	**সংশয়**	অগ্রজ	অনুজ	আবির্ভাব	তিরোভাব
আকর্ষণ	বিকর্ষণ	আস্তিক	নাস্তিক	উত্থান	পতন
উদয়	অস্ত	অধমর্ণ (debtor)	উত্তমর্ণ (creditor)	কৃতজ্ঞ	কৃতঘ্ন
খাতক	মহাজন	গরল	অমৃত	গৌণ	মুখ্য
জঙ্গম	স্থাবর	জোয়ার	ভাটা	ঠুনকো	মজবুত
দাতা	গ্রহীতা	দুর্লভ	সুলভ	নশ্বর	অবিনশ্বর
নিন্দা	প্রশংসা	প্রবীণ	নবীন	প্রসারণ	সংকোচন
মৌখিক	লিখিত	যোজন	বিয়োজন	লঘু	গুরু
সদর	অন্দর	সংশ্লেষণ	বিশ্লেষণ	সন্ধি	বিগ্রহ
সুশীল	দুঃশীল	স্বকীয়	পরকীয়	হ্রাস	বৃদ্ধি
ঐহিক	পারত্রিক	আদি	অন্ত	উৎকৃষ্ট	নিকৃষ্ট
উন্নত	অবনত	আমদানি	রপ্তানি	সঞ্চয়	ব্যয়

Worked example — antonym patterns

Prefix: আদর × **অনাদর** · সুলভ × **দুর্লভ** (সু ↔ দুর্) · সম্মান × **অসম্মান**.
Opposite root pair: আবির্ভাব × **তিরোভাব** · উত্থান × **পতন** · সংকীর্ণ × **প্রশস্ত**.
Exam tip: the antonym must be the same part of speech — a noun for a noun, an adjective for an adjective.

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"প্রত্যয়" শব্দের বিপরীত শব্দ কোনটি? — **সংশয়**. Here প্রত্যয় means "conviction / firm belief", so its opposite is doubt (সংশয়). (Do not confuse with প্রত্যয় = suffix in grammar.)

6.10 বাক্য শুদ্ধি — Sentence correction

Most errors fall into five types: (1) wrong spelling, (2) double suffix / redundancy (বাহুল্য), (3) double plural, (4) সাধু-চলিত মিশ্রণ or গুরুচণ্ডালী দোষ, (5) wrong word form (noun used where adjective/participle is needed) or subject–verb mismatch.

#	অশুদ্ধ	শুদ্ধ	Rule
1	দারিদ্রতা একটি অভিশাপ।	দারিদ্র্য একটি অভিশাপ।	দারিদ্র্য is already a noun; no extra -তা
2	তার সৌজন্যতায় মুগ্ধ হলাম।	তার সৌজন্যে মুগ্ধ হলাম।	double suffix
3	সব ছাত্রগণ উপস্থিত ছিল।	সব ছাত্র উপস্থিত ছিল।	double plural (সব + গণ)
4	সকল সদস্যবৃন্দ সভায় এলেন।	সদস্যবৃন্দ সভায় এলেন।	double plural

5	আবশ্যকীয় কাগজপত্র জমা দিন।	আবশ্যক কাগজপত্র জমা দিন।	আবশ্যক is already an adjective
6	উপরোক্ত বিষয়টি লক্ষণীয়।	উপর্যুক্ত বিষয়টি লক্ষণীয়।	সন্ধি: উপরি + উক্ত = উপর্যুক্ত
7	তিনি সস্ত্রীকসহ এসেছেন।	তিনি সস্ত্রীক এসেছেন।	স- already means "with"
8	তিনি স্বপরিবারে বেড়াতে গেলেন।	তিনি সপরিবারে বেড়াতে গেলেন।	স (with) + পরিবার, not স্ব (own)
9	এ কথা প্রমাণ হয়েছে।	এ কথা প্রমাণিত হয়েছে।	needs the participle form
10	অপমান হওয়ার ভয়ে সে চুপ রইল।	অপমানিত হওয়ার ভয়ে সে চুপ রইল।	needs the participle form
11	সূর্য উদয় হয়েছে।	সূর্য উদিত হয়েছে।	উদয় (noun) → উদিত (participle)
12	বিদ্যান লোক সর্বত্র সমাদৃত।	বিদ্বান লোক সর্বত্র সমাদৃত।	spelling
13	অশ্রুজলে তার বুক ভেসে গেল।	অশ্রুতে তার বুক ভেসে গেল।	অশ্রু already means tears (বাহুল্য)
14	আকণ্ঠ পর্যন্ত খেয়েছি।	আকণ্ঠ খেয়েছি।	আ- already means "up to"
15	শিশুটি ভয়ে ভীত হলো।	শিশুটি ভীত হলো।	redundancy
16	আমরা তাহাকে বলেছি।	আমরা তাকে বলেছি।	সাধু-চলিত মিশ্রণ
17	মড়াদাহ শেষ হলো।	শবদাহ শেষ হলো।	গুরুচণ্ডালী (মড়া + দাহ mismatch)
18	গরুর শকট চলছে।	গরুর গাড়ি চলছে।	গুরুচণ্ডালী
19	ইতিমধ্যে তিনি চলে গেছেন।	ইতোমধ্যে তিনি চলে গেছেন।	সন্ধি: ইতঃ + মধ্যে
20	দুরাবস্থায় পড়ে সে কাঁদল।	দুরবস্থায় পড়ে সে কাঁদল।	দুঃ + অবস্থা = দুরবস্থা
21	সে নিরপরাধী।	সে নিরপরাধ।	নিঃ + অপরাধ already an adjective
22	সে অসুস্থ হয়ে পড়লেন।	সে অসুস্থ হয়ে পড়ল। / তিনি অসুস্থ হয়ে পড়লেন।	honorific subject–verb agreement
23	সে লজ্জাস্কর কাজ করেছে।	সে লজ্জাকর কাজ করেছে।	wrong suffix form
24	সমস্ত দেশময় বন্যা হয়েছে।	সমস্ত দেশে বন্যা হয়েছে। / দেশময় বন্যা হয়েছে।	সমস্ত + -ময় both mean "all over"
25	আসা করি ভালো আছেন।	আশা করি ভালো আছেন।	আশা (hope) vs আসা (coming)

Worked example — find every error in one sentence

সকল ছাত্রগণ সভায় উপস্থিত ছিল এবং তাহারা আকণ্ঠ পর্যন্ত খেল।

(1) Double plural: সকল + গণ ⇒ **সকল ছাত্র**.

(2) সাধু-চলিত মিশ্রণ: তাহারা (সাধু) with খেল (চলিত) ⇒ **তারা**.

(3) বাহুল্য: আকণ্ঠ already means "up to the throat" ⇒ drop পর্যন্ত.

শুদ্ধ: **সকল ছাত্র সভায় উপস্থিত ছিল এবং তারা আকণ্ঠ খেল।**

6.11 বাংলা সাহিত্য — Quick facts

Only stable, frequently asked facts. Read across: item — answer.

প্রথম ও আদি নিদর্শন (firsts)

বিষয়	তথ্য
বাংলা ভাষার উৎপত্তি	ড. মুহম্মদ শহীদুল্লাহর মতে গৌড়ী প্রাকৃত; সুনীতিকুমার চট্টোপাধ্যায়ের মতে মাগধী প্রাকৃত (অপভ্রংশ)
বাংলা সাহিত্যের প্রথম নিদর্শন	**চর্যাপদ** — ১৯০৭ সালে নেপালের রাজদরবারের গ্রন্থাগার থেকে **হরপ্রসাদ শাস্ত্রী** আবিষ্কার করেন; ১৯১৬ সালে বঙ্গীয় সাহিত্য পরিষদ থেকে প্রকাশিত
চর্যাপদের সবচেয়ে বেশি পদ	কাহ্নপা (১৩টি); প্রথম পদটি লুইপার
মধ্যযুগের প্রথম কাব্য	**শ্রীকৃষ্ণকীর্তন** — বড়ু চণ্ডীদাস; ১৯০৯ সালে বসন্তরঞ্জন রায় বিদ্বদ্বল্লভ আবিষ্কার করেন, প্রকাশ ১৯১৬
বাংলা সাহিত্যের প্রথম মুসলমান কবি	শাহ মুহম্মদ সগীর — *ইউসুফ-জোলেখা*
আরাকান রাজসভার কবি	আলাওল — *পদ্মাবতী*
অন্নদামঙ্গল	ভারতচন্দ্র রায়গুণাকর
প্রথম বাংলা ব্যাকরণ	মনোএল দা আসসুম্পসাঁও (১৭৪৩, পর্তুগিজ ভাষায়); বাংলা হরফে মুদ্রিত প্রথম ব্যাকরণ — হ্যালহেড (১৭৭৮)
ফোর্ট উইলিয়াম কলেজ	প্রতিষ্ঠা ১৮০০, কলকাতা; বাংলা বিভাগের প্রধান উইলিয়াম কেরি
প্রথম বাংলা সংবাদপত্র	সমাচার দর্পণ (১৮১৮, শ্রীরামপুর মিশন); প্রথম বাংলা মাসিক পত্রিকা — দিগ্দর্শন (১৮১৮)
বাংলা গদ্যের জনক	ঈশ্বরচন্দ্র বিদ্যাসাগর — বাংলা গদ্যে যতিচিহ্নের সার্থক প্রয়োগ; *বেতাল পঞ্চবিংশতি, শকুন্তলা, সীতার বনবাস*
বাংলা সাহিত্যের প্রথম উপন্যাস	*আলালের ঘরের দুলাল* (১৮৫৮) — প্যারীচাঁদ মিত্র
প্রথম সার্থক উপন্যাস	*দুর্গেশনন্দিনী* (১৮৬৫) — বঙ্কিমচন্দ্র চট্টোপাধ্যায় ("সাহিত্যসম্রাট")
প্রথম সার্থক নাটক	*শর্মিষ্ঠা* (১৮৫৯) — মাইকেল মধুসূদন দত্ত
প্রথম সার্থক মহাকাব্য	*মেঘনাদবধ কাব্য* (১৮৬১) — মধুসূদন; অমিত্রাক্ষর ছন্দ ও বাংলা সনেটের প্রবর্তক
প্রথম সার্থক ছোটগল্পকার	রবীন্দ্রনাথ ঠাকুর
ভাষা আন্দোলনের প্রথম কবিতা	"কাঁদতে আসিনি, ফাঁসির দাবি নিয়ে এসেছি" — মাহবুব-উল-আলম চৌধুরী
"আমার ভাইয়ের রক্তে রাঙানো একুশে ফেব্রুয়ারি"	রচয়িতা আবদুল গাফফার চৌধুরী
মুক্তিযুদ্ধভিত্তিক প্রথম উপন্যাস	*রাইফেল রোটি আওরাত* — আনোয়ার পাশা
বাংলা একাডেমি	প্রতিষ্ঠা ৩ ডিসেম্বর ১৯৫৫, বর্ধমান হাউস, ঢাকা
আন্তর্জাতিক মাতৃভাষা দিবস	ইউনেস্কোর ঘোষণা ১৭ নভেম্বর ১৯৯৯; পালিত হয় ২১ ফেব্রুয়ারি

প্রধান লেখক ও গ্রন্থ

লেখক	উল্লেখযোগ্য গ্রন্থ / তথ্য
রবীন্দ্রনাথ ঠাকুর	১৯১৩ সালে নোবেল (*গীতাঞ্জলি*-র ইংরেজি অনুবাদ *Song Offerings*), প্রথম এশীয় নোবেলজয়ী; জাতীয় সংগীত "আমার সোনার বাংলা"; উপন্যাস *গোরা, চোখের বালি, ঘরে-বাইরে, শেষের কবিতা*

কাজী নজরুল ইসলাম	জাতীয় কবি, "বিদ্রোহী কবি"; "বিদ্রোহী" কবিতা — *অগ্নিবীণা* (১৯২২); পত্রিকা *ধূমকেতু*; রণসংগীত "চল্ চল্ চল্"
দীনবন্ধু মিত্র	*নীলদর্পণ* (নীলকরদের অত্যাচার নিয়ে নাটক)
মীর মশাররফ হোসেন	*বিষাদ-সিন্ধু* (কারবালার কাহিনি), *জমিদার দর্পণ*
বেগম রোকেয়া	*Sultana's Dream*, *অবরোধবাসিনী*, *মতিচূর*, *পদ্মরাগ*
শরৎচন্দ্র চট্টোপাধ্যায়	"অপরাজেয় কথাশিল্পী"; *দেবদাস*, *শ্রীকান্ত*, *পথের দাবী*
জীবনানন্দ দাশ	"রূপসী বাংলার কবি"; *রূপসী বাংলা*, *বনলতা সেন*
জসীমউদ্দীন	"পল্লীকবি"; *নকশী কাঁথার মাঠ*, *সোজন বাদিয়ার ঘাট*
বিভূতিভূষণ বন্দ্যোপাধ্যায়	*পথের পাঁচালী*, *আরণ্যক*
মানিক বন্দ্যোপাধ্যায়	*পদ্মানদীর মাঝি*, *পুতুলনাচের ইতিকথা*
সুকান্ত ভট্টাচার্য	"কিশোর কবি"; *ছাড়পত্র*
সৈয়দ ওয়ালীউল্লাহ	*লালসালু* (১৯৪৮)
মুনীর চৌধুরী	*কবর* (ভাষা আন্দোলনভিত্তিক নাটক, কারাগারে লেখা), *রক্তাক্ত প্রান্তর*
শহীদুল্লা কায়সার / জহির রায়হান	*সংশপ্তক* / *হাজার বছর ধরে*
শওকত ওসমান	*ক্রীতদাসের হাসি*
শামসুর রাহমান	"স্বাধীনতা তুমি", "তোমাকে পাওয়ার জন্যে, হে স্বাধীনতা"
আল মাহমুদ	*সোনালী কাবিন*
সেলিনা হোসেন	*হাঙর নদী গ্রেনেড*
জাহানারা ইমাম	*একাত্তরের দিনগুলি* ("শহীদ জননী")
হুমায়ূন আহমেদ	প্রথম উপন্যাস *নন্দিত নরকে*
বঙ্গবন্ধু শেখ মুজিবুর রহমান	*অসমাপ্ত আত্মজীবনী* (২০১২), *কারাগারের রোজনামচা*, *আমার দেখা নয়াচীন*

ছদ্মনাম (pen names)

ছদ্মনাম	প্রকৃত নাম	ছদ্মনাম	প্রকৃত নাম
ভানুসিংহ ঠাকুর	রবীন্দ্রনাথ ঠাকুর	টেকচাঁদ ঠাকুর	প্যারীচাঁদ মিত্র
কমলাকান্ত	বঙ্কিমচন্দ্র চট্টোপাধ্যায়	অনিলা দেবী	শরৎচন্দ্র চট্টোপাধ্যায়
হুতোম প্যাঁচা	কালীপ্রসন্ন সিংহ	কস্যচিৎ উপযুক্ত ভাইপোস্য	ঈশ্বরচন্দ্র বিদ্যাসাগর
বীরবল	প্রমথ চৌধুরী	বনফুল	বলাইচাঁদ মুখোপাধ্যায়
পরশুরাম	রাজশেখর বসু	যাযাবর	বিনয় মুখোপাধ্যায় (*দৃষ্টিপাত*)
নীললোহিত	সুনীল গঙ্গোপাধ্যায়	কায়কোবাদ	মোহাম্মদ কাজেম আল কোরায়শী (*মহাশ্মশান*)
সত্যসুন্দর দাস	মোহিতলাল মজুমদার		

6.12 বাংলা ফোকাস রাইটিং — Bangla Focus Writing

Bangla Focus Writing is 10 marks in the BSCS SO IT / Officer IT written papers, and BSCS AP/Officer IT (03.01.2026) had a Bangla essay. Write 150–250 words in প্রমিত চলিত ভাষা, in about 12–15 minutes.

Structure that earns full marks (6 parts)

1. **ভূমিকা** (1–2 sentences): define the topic and say why it matters now.
2. **বর্তমান প্রেক্ষাপট**: 1–2 Bangladesh facts (NPSB, BEFTN, RTGS, বাংলা কিউআর, MFS, ই-কেওয়াইসি, এজেন্ট ব্যাংকিং). Never write a number you are not sure of.
3. **সুবিধা / গুরুত্ব**: 3 points.
4. **চ্যালেঞ্জ**: 2–3 points (সাইবার ঝুঁকি, ডিজিটাল সাক্ষরতা, অবকাঠামো).
5. **করণীয়**: 3 recommendations.
6. **উপসংহার**: one strong closing sentence.

Mistakes that cut marks

- সাধু-চলিত মিশ্রণ (তাহার + করেছে). Use only চলিত: তার, করে, হয়েছে.
- Wrong spelling of common words: সরকারি, তৈরি, দুর্নীতি, ইতোমধ্যে, উজ্জ্বল, পরিষ্কার, সত্ত্বেও (see 6.1).
- Too many English words: use Bangla where it exists (লেনদেন, প্রমাণীকরণ, সাক্ষরতা); keep only standard terms like NPSB, QR, OTP.

Useful phrases (প্রস্তুত বাক্যাংশ)

বর্তমান বিশ্বে ... অপরিহার্য হয়ে উঠেছে · এর ফলে ... · একদিকে ... অন্যদিকে ... · তবে এ পথে কিছু চ্যালেঞ্জ রয়েছে · এ সমস্যা মোকাবিলায় ... প্রয়োজন · সরকারি ও বেসরকারি উদ্যোগের সমন্বয়ে · সর্বোপরি · সঠিক পরিকল্পনা ও বাস্তবায়নের মাধ্যমেই ...

Model 1 — ডিজিটাল ব্যাংকিং ও নগদবিহীন সমাজ

প্রযুক্তির অগ্রগতির সঙ্গে সঙ্গে ব্যাংকিং সেবা এখন আর শাখার চার দেয়ালে সীমাবদ্ধ নেই। ইন্টারনেট ব্যাংকিং, মোবাইল অ্যাপ, এটিএম, এজেন্ট ব্যাংকিং ও মোবাইল আর্থিক সেবার মাধ্যমে গ্রাহক যেকোনো সময়, যেকোনো স্থান থেকে লেনদেন করতে পারছেন। এই ডিজিটাল ব্যাংকিংই নগদবিহীন সমাজের মূল ভিত্তি। নগদবিহীন সমাজ বলতে এমন একটি ব্যবস্থাকে বোঝায়, যেখানে অধিকাংশ লেনদেন কাগুজে নোটের বদলে ইলেকট্রনিক মাধ্যমে সম্পন্ন হয়। বাংলাদেশে NPSB-এর মাধ্যমে তাৎক্ষণিক আন্তঃব্যাংক লেনদেন, BEFTN ও RTGS-এর মাধ্যমে তহবিল স্থানান্তর এবং বাংলা কিউআর দিয়ে দোকানে মূল্য পরিশোধ এই রূপান্তরকে এগিয়ে নিচ্ছে। নগদবিহীন লেনদেনের সুবিধা অনেক: লেনদেন দ্রুত ও স্বচ্ছ হয়, টাকা ছাপানো ও পরিবহনের খরচ কমে, দুর্নীতি ও অর্থপাচার রোধ সহজ হয় এবং সরকারের রাজস্ব আদায় বাড়ে। তবে চ্যালেঞ্জও কম নয়। গ্রামীণ জনগোষ্ঠীর ডিজিটাল সাক্ষরতার অভাব, দুর্বল ইন্টারনেট সংযোগ, সাইবার প্রতারণা এবং ছোট ব্যবসায়ীদের লেনদেন খরচ এখনো বড় বাধা। এ অবস্থায় সহজ ও বাংলা ভাষাভিত্তিক অ্যাপ তৈরি, লেনদেন খরচ কমানো, গ্রাহক সচেতনতা বৃদ্ধি এবং শক্তিশালী সাইবার নিরাপত্তা নিশ্চিত করা প্রয়োজন। সরকার, বাংলাদেশ ব্যাংক ও আর্থিক প্রতিষ্ঠানগুলোর সমন্বিত উদ্যোগে ডিজিটাল ব্যাংকিং একটি স্বচ্ছ, দক্ষ ও অন্তর্ভুক্তিমূলক নগদবিহীন সমাজ গড়ে তুলতে পারে।

English meaning

With the progress of technology, banking is no longer limited to the four walls of a branch; through internet banking, mobile apps, ATMs, agent banking and mobile financial services, customers can transact at any time from anywhere. Digital banking is the foundation of a cashless society, a system in which most transactions are made electronically instead of with paper notes. In Bangladesh, instant interbank transfers through NPSB, fund transfers through BEFTN and RTGS, and shop payments with Bangla QR are driving this change. Cashless transactions are fast and transparent, cut the cost of printing and moving cash, make it easier to stop corruption and money laundering, and raise government revenue. But the challenges are real: low digital literacy in rural areas, weak internet, cyber fraud and transaction costs for small traders. Simple Bangla-language apps, lower fees, customer awareness and strong cyber security are needed. With joint efforts of the government, Bangladesh Bank and financial institutions, digital banking can build a transparent, efficient and inclusive cashless society.

Model 2 — ব্যাংকিং খাতে সাইবার নিরাপত্তা

ব্যাংকিং খাত এখন পুরোপুরি প্রযুক্তিনির্ভর। কোর ব্যাংকিং সিস্টেম, ইন্টারনেট ব্যাংকিং, কার্ড ও মোবাইল অ্যাপের মাধ্যমে প্রতিদিন বিপুল অর্থের লেনদেন হয়। ফলে সাইবার অপরাধীদের প্রধান লক্ষ্যও এখন ব্যাংক। সাইবার নিরাপত্তা হলো তথ্য, নেটওয়ার্ক ও সিস্টেমকে অননুমোদিত প্রবেশ, চুরি ও ক্ষতি থেকে রক্ষা করার ব্যবস্থা। ব্যাংকিং খাতে প্রধান হুমকিগুলো হলো ফিশিং, র‍্যানসমওয়্যার, এটিএম স্কিমিং, ভুয়া কল করে ওটিপি সংগ্রহ এবং প্রতিষ্ঠানের ভেতরের লোকের অসততা। ২০১৬ সালে বাংলাদেশ ব্যাংকের রিজার্ভ চুরির ঘটনা দেখিয়েছে, একটি নিরাপত্তা দুর্বলতা কত বড় আর্থিক ক্ষতি ও আস্থার সংকট তৈরি করতে পারে। সাইবার হামলায় শুধু অর্থই নষ্ট হয় না, গ্রাহকের ব্যক্তিগত তথ্য ফাঁস হয় এবং ব্যাংকের সুনাম ক্ষুণ্ন হয়। এ ঝুঁকি মোকাবিলায় ব্যাংকগুলোকে ফায়ারওয়াল, এনক্রিপশন ও বহুস্তরের প্রমাণীকরণের মতো নিরাপত্তাব্যবস্থা গ্রহণ করতে হবে। চব্বিশ ঘণ্টা নজরদারির জন্য সিকিউরিটি অপারেশনস সেন্টার, নিয়মিত পেনিট্রেশন টেস্টিং ও আইটি অডিট এবং বাংলাদেশ ব্যাংকের আইসিটি নিরাপত্তা নির্দেশিকা কঠোরভাবে মেনে চলা জরুরি। পাশাপাশি কর্মীদের প্রশিক্ষণ এবং গ্রাহকদের সচেতন করা — "পিন বা ওটিপি কাউকে দেবেন না" — সবচেয়ে সাশ্রয়ী প্রতিরক্ষা। মনে রাখতে হবে, নিরাপত্তা ছাড়া আস্থা আসে না, আর আস্থা ছাড়া ব্যাংকিং চলে না। তাই সাইবার নিরাপত্তা ব্যাংকের বাড়তি খরচ নয়, বরং টিকে থাকার অপরিহার্য বিনিয়োগ।

English meaning

Banking now depends fully on technology: huge sums move every day through core banking systems, internet banking, cards and mobile apps, so banks have become the main target of cyber criminals. Cyber security means protecting information, networks and systems from unauthorised access, theft and damage. The main threats are phishing, ransomware, ATM skimming, fake calls to collect OTPs and dishonest insiders. The 2016 Bangladesh Bank reserve theft showed how one security weakness can cause huge financial loss and a crisis of trust. A cyber attack not only loses money but also leaks customers' personal data and damages the bank's reputation. Banks must adopt firewalls, encryption and multi-factor authentication, run a 24-hour Security Operations Center, do regular penetration testing and IT audits, and strictly follow Bangladesh Bank's ICT Security Guideline. Staff training and customer awareness ("never share your PIN or OTP") are the most cost-effective defence. Without security there is no trust, and without trust there is no banking, so cyber security is not an extra cost but an essential investment for survival.

Model 3 — স্মার্ট বাংলাদেশ

ডিজিটাল বাংলাদেশের পরবর্তী ধাপ হিসেবে "স্মার্ট বাংলাদেশ" ধারণাটি সামনে আনা হয়, যার লক্ষ্য ২০৪১ সালের মধ্যে একটি জ্ঞানভিত্তিক, উদ্ভাবনী ও উন্নত দেশ গড়ে তোলা। এর চারটি স্তম্ভ হলো স্মার্ট নাগরিক, স্মার্ট সরকার, স্মার্ট অর্থনীতি ও স্মার্ট সমাজ। স্মার্ট নাগরিক মানে প্রযুক্তি ব্যবহারে দক্ষ, সচেতন ও দায়িত্বশীল মানুষ। স্মার্ট সরকার মানে কাগজবিহীন, স্বচ্ছ ও জবাবদিহিমূলক প্রশাসন, যেখানে নাগরিক ঘরে বসেই অনলাইনে সেবা পাবেন। স্মার্ট অর্থনীতি গড়ে উঠবে নগদবিহীন লেনদেন, ই-কমার্স, ফ্রিল্যান্সিং ও উদ্ভাবননির্ভর শিল্পের ওপর। আর স্মার্ট সমাজ হবে অন্তর্ভুক্তিমূলক, যেখানে গ্রাম-শহর, নারী-পুরুষ সবাই প্রযুক্তির সুফল সমানভাবে পাবে। এ লক্ষ্য অর্জনে কৃত্রিম বুদ্ধিমত্তা, ইন্টারনেট অব থিংস, ক্লাউড কম্পিউটিং ও বিগ ডেটার মতো চতুর্থ শিল্পবিপ্লবের প্রযুক্তি গুরুত্বপূর্ণ ভূমিকা রাখবে। ব্যাংকিং খাতও এর বাইরে নয়; ই-কেওয়াইসি, ডিজিটাল ঋণ ও কিউআর পেমেন্ট স্মার্ট অর্থনীতির ভিত্তি তৈরি করছে। তবে পথটি সহজ নয়। ডিজিটাল বৈষম্য, দক্ষ জনবলের ঘাটতি, সাইবার ঝুঁকি এবং দুর্বল অবকাঠামো বড় চ্যালেঞ্জ। তাই শিক্ষাব্যবস্থায় প্রযুক্তি ও উদ্ভাবনকে গুরুত্ব দেওয়া, দেশজুড়ে সাশ্রয়ী উচ্চগতির ইন্টারনেট নিশ্চিত করা, তথ্য সুরক্ষা জোরদার করা এবং সরকারি-বেসরকারি অংশীদারত্ব বাড়ানো প্রয়োজন। সম্মিলিত প্রচেষ্টায় স্মার্ট বাংলাদেশের স্বপ্ন বাস্তবে রূপ নিতে পারে।

English meaning

"Smart Bangladesh" was introduced as the next step after Digital Bangladesh, aiming to build a knowledge-based, innovative and developed country by 2041. Its four pillars are Smart Citizen, Smart Government, Smart Economy and Smart Society: tech-skilled and responsible citizens; a paperless, transparent and accountable government that serves people online; an economy built on cashless payments, e-commerce, freelancing and innovation; and an inclusive society in which villages and cities, women and men share the benefits of technology equally. Fourth Industrial Revolution technologies such as AI, IoT, cloud computing and big data will play a key role, and banking is part of it through e-KYC, digital lending and QR payments. The obstacles are the digital divide, a shortage of skilled people, cyber risk and weak infrastructure. So technology and innovation must be stressed in education, affordable high-speed internet ensured across the country, data protection strengthened and public-private partnership expanded. With joint effort the dream of Smart Bangladesh can become real. (Policy names and targets can change with government — verify latest before the exam.)

Model 4 — আর্থিক অন্তর্ভুক্তি

আর্থিক অন্তর্ভুক্তি বলতে বোঝায় সমাজের প্রত্যেক মানুষ, বিশেষ করে দরিদ্র, গ্রামীণ ও সুবিধাবঞ্চিত জনগোষ্ঠী, যাতে সাশ্রয়ী খরচে নিরাপদ ও প্রয়োজনীয় আর্থিক সেবা — হিসাব খোলা, সঞ্চয়, ঋণ, বিমা ও লেনদেন — পেতে পারে। টেকসই উন্নয়নের জন্য আর্থিক অন্তর্ভুক্তি অপরিহার্য, কারণ ব্যাংকিং সেবার বাইরে থাকা মানুষ উচ্চ সুদের মহাজনি ঋণের ওপর নির্ভর করে এবং তাদের সঞ্চয় অনিরাপদ থাকে। বাংলাদেশে এ ক্ষেত্রে উল্লেখযোগ্য অগ্রগতি হয়েছে। কৃষকের দশ টাকার ব্যাংক হিসাব, এজেন্ট ব্যাংকিং, উপশাখা এবং মোবাইল আর্থিক সেবা প্রত্যন্ত অঞ্চলের মানুষকেও আনুষ্ঠানিক আর্থিক ব্যবস্থার আওতায় এনেছে। সরকারি ভাতা ও প্রবাসী আয় এখন সরাসরি মোবাইল ওয়ালেট বা ব্যাংক হিসাবে পৌঁছে যাচ্ছে, আর ই-কেওয়াইসির মাধ্যমে কয়েক মিনিটেই হিসাব খোলা সম্ভব হচ্ছে। তবু চ্যালেঞ্জ রয়ে গেছে: নারী ও গ্রামীণ জনগোষ্ঠীর আর্থিক ও ডিজিটাল সাক্ষরতার ঘাটতি, জামানতের অভাবে ক্ষুদ্র উদ্যোক্তাদের ঋণ না পাওয়া, প্রতারণার ভয় এবং খোলার পর অনেক হিসাবের নিষ্ক্রিয় থাকা। এ সমস্যা সমাধানে আর্থিক সাক্ষরতা কর্মসূচি, নারীবান্ধব ও সহজ সেবা, তথ্যভিত্তিক ক্ষুদ্রঋণ, কম খরচের লেনদেন এবং শক্তিশালী গ্রাহক সুরক্ষা প্রয়োজন। আর্থিক অন্তর্ভুক্তি কেবল ব্যাংক হিসাবের সংখ্যা বাড়ানো নয়; প্রতিটি মানুষকে অর্থনীতির সক্রিয় অংশীদার করে তোলাই এর মূল লক্ষ্য।

English meaning

Financial inclusion means that everyone, especially poor, rural and disadvantaged people, can get safe and necessary financial services (accounts, savings, credit, insurance and payments) at an affordable cost. It is essential for sustainable development, because people outside banking depend on high-interest moneylenders and keep their savings unsafe. Bangladesh has made notable progress: Tk 10 bank accounts for farmers, agent banking, sub-branches and mobile financial services have brought people in remote areas into the formal system; government allowances and remittances now reach mobile wallets or bank accounts directly, and e-KYC lets people open an account in minutes. Challenges remain: weak financial and digital literacy among women and rural people, lack of collateral that keeps small entrepreneurs from getting loans, fear of fraud, and many accounts that become dormant after opening. Financial-literacy programmes, simple women-friendly services, data-based micro-loans, low-cost transactions and strong customer protection are needed. Financial inclusion is not only about the number of bank accounts; its real aim is to make every person an active partner in the economy.

Past Bangla Focus topic BSCS SO IT 2026 (25104)

Topic: Digital transformation of Bangladesh's banking sector under the impact of the Fourth Industrial Revolution (চতুর্থ শিল্পবিপ্লবের প্রভাবে বাংলাদেশের ব্যাংকিং খাতে ডিজিটাল রূপান্তর).
Solution plan: ভূমিকা (চতুর্থ শিল্পবিপ্লব = কৃত্রিম বুদ্ধিমত্তা, ব্লকচেইন, ক্লাউড, বিগ ডেটা, আইওটি) → বাংলাদেশে রূপান্তর (NPSB ও RTGS-এ তাৎক্ষণিক লেনদেন, ই-কেওয়াইসি, বাংলা কিউআর, ডিজিটাল ব্যাংক) → সুবিধা (প্রতারণা শনাক্তে কৃত্রিম বুদ্ধিমত্তা, ঋণঝুঁকি মূল্যায়ন, চ্যাটবটে ২৪ ঘণ্টা সেবা) → চ্যালেঞ্জ (সাইবার হামলা — ২০১৬ সালের রিজার্ভ চুরি, ডিজিটাল সাক্ষরতার ঘাটতি, দক্ষ জনবলের অভাব) → করণীয় (সাইবার নিরাপত্তা অবকাঠামো, কর্মীদের পুনঃদক্ষতা উন্নয়ন, গ্রাহক সচেতনতা, যুগোপযোগী নীতিমালা) → উপসংহার: "সঠিক পরিকল্পনায় চতুর্থ শিল্পবিপ্লব বাংলাদেশের ব্যাংকিং খাতকে আরও দক্ষ, স্বচ্ছ ও অন্তর্ভুক্তিমূলক করে তুলতে পারে।" Sentences from Models 1–3 above fit straight into this plan.

Past Bangla essay AP · BSCS 03.01.2026

Topic: দুর্নীতিমুক্ত দেশ গঠনে তরুণদের ভূমিকা (The role of youth in building a corruption-free country).

Model answer (short): দুর্নীতি হলো ব্যক্তিগত স্বার্থে ক্ষমতা বা পদের অপব্যবহার, যা একটি দেশের উন্নয়নের সবচেয়ে বড় বাধা। ঘুষ, স্বজনপ্রীতি, অর্থপাচার ও সরকারি সম্পদের অপচয় সাধারণ মানুষের অধিকার কেড়ে নেয় এবং রাষ্ট্রের প্রতি আস্থা নষ্ট করে। দেশের জনসংখ্যার বড় অংশ তরুণ, এবং তারা প্রযুক্তিতে দক্ষ ও পরিবর্তনের জন্য আগ্রহী; তাই দুর্নীতি প্রতিরোধে তাদের ভূমিকা সবচেয়ে কার্যকর। তরুণেরা প্রথমে নিজেরা সৎ থাকবে এবং পরিবার ও কর্মক্ষেত্রে সততার দৃষ্টান্ত স্থাপন করবে। তথ্য অধিকার আইন ব্যবহার করে তারা সরকারি কাজের তথ্য জানতে পারে, অনলাইন ও ডিজিটাল সেবা জনপ্রিয় করে ঘুষের সুযোগ কমাতে পারে এবং সামাজিক যোগাযোগমাধ্যমে দায়িত্বশীলভাবে অনিয়ম তুলে ধরে জবাবদিহি দাবি করতে পারে। স্বেচ্ছাসেবী সংগঠন, বিতর্ক ও সচেতনতামূলক কর্মসূচির মাধ্যমে তারা সমাজে দুর্নীতিবিরোধী মনোভাব গড়ে তুলতে পারে। তবে রাজনৈতিক প্রভাব, হয়রানির ভয় ও বেকারত্ব তাদের পথে বাধা। তাই রাষ্ট্রকে তথ্য প্রকাশকারীর সুরক্ষা, স্বচ্ছ নিয়োগ এবং নৈতিক শিক্ষা নিশ্চিত করতে হবে। সৎ ও সচেতন তরুণ প্রজন্মই একটি দুর্নীতিমুক্ত, ন্যায়ভিত্তিক বাংলাদেশ গড়ে তুলতে পারে।

English meaning: Corruption is the misuse of power or position for personal gain and the biggest barrier to development; bribery, nepotism, money laundering and waste of public resources take away people's rights and destroy trust in the state. Youth are a large share of the population, tech-skilled and eager for change, so their role is the most effective. They should first stay honest and set an example; use the Right to Information Act, promote online services to reduce chances for bribes, and expose irregularities responsibly on social media to demand accountability; and build anti-corruption attitudes through volunteering, debates and awareness programmes. Political influence, fear of harassment and unemployment are obstacles, so the state must protect whistle-blowers, ensure transparent recruitment and moral education. An honest, aware young generation can build a corruption-free, just Bangladesh.

6.13 Practice MCQ

1. কোনটি শুদ্ধ বানান?

(a) মুহুর্ত (b) মূহুর্ত
(c) মুহূর্ত (d) মূহূর্ত

Answer: (c) — তৎসম word: মু (short) + হূ (long).

2. কোনটি শুদ্ধ বানান?

(a) দুর্ণীতি (b) দূর্নীতি
(c) দুর্নীতি (d) দূর্ণীতি

Answer: (c) — prefix দুর্ (short উ); compound word, so ণত্ব does not apply.

3. "সরকারি" শব্দে ই-কার হওয়ার কারণ —

(a) তৎসম শব্দ (b) অতৎসম শব্দ
(c) স্ত্রীবাচক শব্দ (d) সন্ধিজাত শব্দ

Answer: (b) — সরকার is a বিদেশি word; অতৎসম words take ই (Bangla Academy).

4. কোনটি শুদ্ধ বানান?

(a) পুরষ্কার
(b) পুরস্কার
(c) পুরুস্কার
(d) পুরুষ্কার

Answer: (b) — পুরঃ + কার; অ-কারের পর বিসর্গ + ক → স্ক.

5. "বিদ্যালয়" শব্দের সন্ধিবিচ্ছেদ —

(a) বিদ্য + আলয়
(b) বিদ্যা + আলয়
(c) বিদ্যা + লয়
(d) বিদ + আলয়

Answer: (b) — আ + আ = আ (স্বরসন্ধি).

6. "নিশ্চয়" শব্দের সন্ধিবিচ্ছেদ —

(a) নিস + চয়
(b) নিঃ + চয়
(c) নিশ + চয়
(d) নি + চয়

Answer: (b) — বিসর্গ + চ → শ্চ.

7. "উচ্ছ্বাস" শব্দের সন্ধিবিচ্ছেদ —

(a) উৎ + শ্বাস
(b) উৎ + ছ্বাস
(c) উদ্ + শ্বাস
(d) উচ্ + শ্বাস

Answer: (a) — ত + শ → চ্ছ (ব্যঞ্জনসন্ধি).

8. "মনোযোগ" শব্দের সন্ধিবিচ্ছেদ —

(a) মনো + যোগ
(b) মন + যোগ
(c) মনঃ + যোগ
(d) মনস + যোগ

Answer: (c) — অঃ + voiced consonant → ও (বিসর্গসন্ধি).

9. "পঙ্কজ" কোন সমাস?

(a) বহুব্রীহি
(b) উপপদ তৎপুরুষ
(c) কর্মধারয়
(d) দ্বিগু

Answer: (b) — পঙ্কে জন্মে যা; the latter part জ comes from a verb root (উপপদ).

10. "ত্রিকাল" কোন সমাস?

(a) দ্বিগু
(b) দ্বন্দ্ব
(c) বহুব্রীহি
(d) অব্যয়ীভাব

Answer: (a) — তিন কালের সমাহার; number + collection = দ্বিগু.

11. "আমরণ" কোন সমাস?

(a) তৎপুরুষ
(b) কর্মধারয়
(c) অব্যয়ীভাব
(d) বহুব্রীহি

Answer: (c) — মরণ পর্যন্ত; the indeclinable আ (up to) dominates.

12. "নীলকণ্ঠ" কোন সমাস?

(a) কর্মধারয়
(b) বহুব্রীহি
(c) দ্বিগু
(d) তৎপুরুষ

Answer: (b) — নীল কণ্ঠ যার (Shiva, a third person). Compare নীলপদ্ম = কর্মধারয়.

13. "তিলে তৈল আছে" — "তিলে" কোন কারকে কোন বিভক্তি?

(a) অপাদানে সপ্তমী
(b) করণে সপ্তমী
(c) অধিকরণে সপ্তমী
(d) কর্মে সপ্তমী

Answer: (c) — oil is *in* sesame (ব্যাপ্তি অধিকরণ); "তিলে তৈল হয়" would be অপাদান.

14. "ভিখারিকে ভিক্ষা দাও" — "ভিখারিকে" কোন কারক?

(a) কর্ম
(b) সম্প্রদান
(c) করণ
(d) অপাদান

Answer: (b) — something is given away without wanting it back.

15. "পাঠক" শব্দের প্রকৃতি-প্রত্যয় —

(a) পঠ্ + অক
(b) পাঠ + ক
(c) পঠ্ + ক
(d) পাঠ্ + অক

Answer: (a) — √পঠ্ + অক (কৃৎ প্রত্যয়); the vowel lengthens to পা.

16. কোনটি খাঁটি বাংলা উপসর্গ?

(a) প্র
(b) পরা
(c) অঘা
(d) অভি

Answer: (c) — অঘা (অঘামারা) is in the list of 21 বাংলা উপসর্গ; the others are তৎসম.

17. "বেহায়া" শব্দে "বে" কোন ভাষার উপসর্গ?

(a) আরবি
(b) ফারসি
(c) ইংরেজি
(d) তৎসম

Answer: (b) — ফারসি বে (without): বেহায়া, বেআদব, বেকার.

18. "অরণ্যে রোদন" বাগধারার অর্থ —

(a) বনে কান্না
(b) নিষ্ফল আবেদন
(c) গভীর দুঃখ
(d) একাকিত্ব

Answer: (b) — an appeal nobody hears (useless request).

19. "শাঁখের করাত" বাগধারার অর্থ —

(a) ধারালো অস্ত্র
(b) উভয় সংকট
(c) কঠোর পরিশ্রম
(d) কপটতা

Answer: (b) — a saw that cuts both ways: trouble on both sides.

20. "যা ক্রমশ ক্ষয় পাচ্ছে" — এক কথায়

(a) ক্ষয়িত
(b) ক্ষয়িষ্ণু
(c) ক্ষীয়মাণ
(d) বর্ধিষ্ণু

Answer: (b) — ক্ষয়িষ্ণু; its opposite is বর্ধিষ্ণু (growing).

21. "বেঁচে থাকার ইচ্ছা" — এক কথায়

(a) জিগীষা
(b) জিজ্ঞাসা
(c) জিজীবিষা
(d) মুমুক্ষা

Answer: (c) — জিজীবিষা; জিগীষা = desire to win, জিজ্ঞাসা = desire to know.

22. "অনল" শব্দের সমার্থক —

(a) বাতাস
(b) আগুন
(c) পানি
(d) আকাশ

Answer: (b) — অনল = অগ্নি; বাতাস = অনিল (do not confuse অনল / অনিল).

23. "অধমর্ণ" শব্দের বিপরীত —

(a) উত্তমর্ণ
(b) মহাজন
(c) খাতক
(d) ঋণী

Answer: (a) — অধমর্ণ = debtor, উত্তমর্ণ = creditor (a banking pair).

24. কোন বাক্যটি শুদ্ধ?

(a) দারিদ্রতা একটি অভিশাপ
(b) দারিদ্র্য একটি অভিশাপ
(c) দারিদ্র্যতা একটি অভিশাপ
(d) দরিদ্র্যতা একটি অভিশাপ

Answer: (b) — দারিদ্র্য is already a noun; adding -তা doubles the suffix.

25. কোন বাক্যটি শুদ্ধ?

(a) সব ছাত্রগণ উপস্থিত ছিল
(b) সকল ছাত্রেরা উপস্থিত ছিল
(c) ছাত্রগণ উপস্থিত ছিল
(d) সব ছাত্রবৃন্দ উপস্থিত ছিল

Answer: (c) — only one plural marker; the others use two.

26. চর্যাপদ আবিষ্কার করেন —

(a) ড. মুহম্মদ শহীদুল্লাহ
(b) হরপ্রসাদ শাস্ত্রী
(c) সুনীতিকুমার চট্টোপাধ্যায়
(d) বসন্তরঞ্জন রায়

Answer: (b) — 1907, Nepal royal library. বসন্তরঞ্জন রায় found শ্রীকৃষ্ণকীর্তন.

27. বাংলা সাহিত্যের প্রথম সার্থক উপন্যাস —

(a) আলালের ঘরের দুলাল
(b) দুর্গেশনন্দিনী
(c) বিষাদ-সিন্ধু
(d) কপালকুণ্ডলা

Answer: (b) — বঙ্কিমচন্দ্র, 1865. আলালের ঘরের দুলাল is the first novel, not the first "সার্থক" one.

28. "ভানুসিংহ ঠাকুর" কার ছদ্মনাম?

(a) বঙ্কিমচন্দ্র
(b) রবীন্দ্রনাথ ঠাকুর
(c) প্যারীচাঁদ মিত্র
(d) কালীপ্রসন্ন সিংহ

Answer: (b) — *ভানুসিংহ ঠাকুরের পদাবলী*. টেকচাঁদ ঠাকুর = প্যারীচাঁদ মিত্র.

29. "লালসালু" উপন্যাসের রচয়িতা —

(a) শওকত ওসমান
(b) সৈয়দ ওয়ালীউল্লাহ
(c) জহির রায়হান
(d) মুনীর চৌধুরী

Answer: (b) — published 1948.

30. বাংলা একাডেমি প্রতিষ্ঠিত হয় —

(a) ১৯৫২
(b) ১৯৫৪
(c) ১৯৫৫
(d) ১৯৫৬

Answer: (c) — 3 December 1955, Burdwan House, Dhaka.

Chapter 7 — General Knowledge

> **Read this first — facts that change**
>
> Office-holders, policy rates, rankings, member counts, GDP/budget figures and names of projects or institutions (several were renamed after August 2024) can change at any time. This chapter keeps to **stable facts**; anything that can change is marked **(verify latest)**. On the day before the exam, spend 15–20 minutes on the national, economy and international pages of a newspaper and on the Bangladesh Bank website.

GK carries **10 MCQ marks** in the BSCS Assistant Programmer paper (−0.25 per wrong answer) and **10 written marks** (usually 5–10 one-line questions) in several other bank IT papers. Past papers show three favourite areas: **Bangladesh (history, geography, firsts)**, **banking & payment systems**, and **international organisations (full forms, HQs, reports)**. If you are unsure of an MCQ answer and cannot eliminate two options, skip it — a wrong answer costs 0.25.

7.1 Past GK questions — fully solved

Every question below appeared in a recent bank IT paper. The answer is in bold; the extra line is the "related fact" examiners like to turn into the next question.

Past questions BSCS AP 03.01.2026

1. *Where is the first earthquake observatory in Bangladesh?* — **Chattogram (1954)**. Earthquake magnitude is measured on the Richter scale with a seismograph.
2. *Full form of WIPO.* — **World Intellectual Property Organization**; a UN specialised agency, HQ Geneva. It deals with patents, copyright and trademarks.
3. *When was VAT introduced in Bangladesh?* — **1 July 1991** (Value Added Tax Act 1991). It was later replaced by the VAT and Supplementary Duty Act 2012, in force from 1 July 2019. VAT is collected by the NBR.
4. *First bank owned by Bengali entrepreneurs.* — **Eastern Mercantile Bank (1959), now Pubali Bank** — the common answer; some sources also name the Comilla Banking Corporation of the British period.
5. *Headquarters of CIRDAP.* — **Dhaka**. CIRDAP = Centre on Integrated Rural Development for Asia and the Pacific (1979).
6. *Inventor of dynamite.* — **Alfred Nobel** (Sweden, 1867); his will created the Nobel Prizes (first awarded 1901).
7. *Which country won the men's singles at the ITTF World Championships 2025?* — **China (Wang Chuqin)**. A current-affairs item: such questions come from the last 12 months of sport news.
8. *How many layers are in the OSI model?* — **7**: Physical, Data Link, Network, Transport, Session, Presentation, Application.
9. *Meaning of "Terracotta".* — **Baked clay** (Italian "baked earth"). Kantajew (Kantaji) Temple, Dinajpur, is famous for terracotta work.
10. *Which organisation grants the GSP+ facility?* — **European Union (EU)**. GSP+ is the EU's special incentive arrangement for sustainable development and good governance; Bangladesh will need it after LDC graduation (graduation scheduled for November 2026 — verify latest).

Past questions SO IT 2026 (25104)

1. *Full form of NPSB.* — **National Payment Switch Bangladesh** (2012). It links ATM/POS/internet banking of different banks.
2. *Architect of the National Martyrs' Memorial, Savar.* — **Syed Mainul Hosain**. (Central Shaheed Minar: Hamidur Rahman; Parliament building: Louis I. Kahn.)
3. *Central bank of the United Kingdom.* — **Bank of England** (1694). USA: Federal Reserve System; India: Reserve Bank of India; China: People's Bank of China; Japan: Bank of Japan; Eurozone: European Central Bank (Frankfurt).
4. *Publisher of the "World Economic Outlook".* — **IMF**. (World Development Report: World Bank; Human Development Report: UNDP.)
5. *Bangladesh's first submarine cable.* — **SEA-ME-WE 4** (2006, landing station Cox's Bazar). Second: SEA-ME-WE 5 (2017, Kuakata). Operator: BSCCL.

Past questions Officer IT 2026 (25105)

1. *Organisation for global health monitoring and pandemic coordination.* — **WHO** (1948, Geneva). World Health Day: 7 April.
2. *Bangladesh's first deep sea port.* — **Matarbari, Maheshkhali, Cox's Bazar** (under construction, JICA-supported).
3. *Headquarters of the IMF.* — **Washington, D.C.** (World Bank is also in Washington, D.C.)
4. *Country with the world's longest coastline.* — **Canada**.
5. *Year Rabindranath Tagore won the Nobel Prize.* — **1913**, Literature, for *Gitanjali (Song Offerings)*; first Asian Nobel laureate.
6. *Bangladesh's only coral island.* — **Saint Martin's Island** (Narikel Jinjira), Teknaf, Cox's Bazar.
7. *SAARC headquarters.* — **Kathmandu, Nepal**. SAARC was founded in Dhaka on 8 December 1985.
8. *Who is called the "Clearing House" of banks in Bangladesh?* — **Bangladesh Bank**; it runs BACH, and inter-bank dues are finally settled in banks' current accounts with it.
9. *First private commercial bank of the country.* — **AB Bank (Arab Bangladesh Bank), 1982**. First Islamic bank: Islami Bank Bangladesh (1983).
10. *Word size of the Intel 8086 microprocessor.* — **16-bit** (16-bit data bus, 20-bit address bus → 1 MB addressable memory).

Past questions Officer IT MCQ 2026 (BIBM)

1. *The Tin Bigha Corridor is in which district?* — **Lalmonirhat** (Patgram upazila); it links the Dahagram–Angarpota enclave with the mainland.
2. *Birishiri Small Ethnic Groups Cultural Academy is in which district?* — **Netrokona** (Durgapur upazila).
3. *Who discovered mercurous nitrite?* — **Acharya Prafulla Chandra Ray** (1896); founder of Bengal Chemical.
4. *First organisation of the Language Movement.* — **Tamaddun Majlis** (1 September 1947, founder Prof. Abul Kashem).
5. *International Literacy Day.* — **8 September** (UNESCO).
6. *Where was the first computer in Bangladesh installed?* — **Atomic Energy Centre, Dhaka** — an IBM 1620, in 1964.
7. *Full form of NPSB.* — **National Payment Switch Bangladesh**.

Pattern you can exploit

Roughly half the past GK items are "firsts" and "full forms/HQs" (first computer, first private bank, first submarine cable, NPSB, WIPO, CIRDAP, IMF, SAARC). Learn the "Firsts" table in 7.2.6 and the HQ table in 7.4 thoroughly — they give the best marks per minute.

7.2 Bangladesh — history, Liberation War, Constitution, geography, symbols

7.2.1 Key dates before 1971

Date	Event
23 June 1757	Battle of Plassey — Nawab Siraj-ud-Daulah defeated; start of British rule in Bengal
16 October 1905	Partition of Bengal (Lord Curzon); annulled in 1911
30 December 1906	All-India Muslim League founded in Dhaka
23 March 1940	Lahore Resolution, moved by A. K. Fazlul Huq
14 August 1947	Pakistan created; East Bengal (later East Pakistan) becomes part of it
1 September 1947	Tamaddun Majlis formed — first organisation of the Language Movement
23 June 1949	Awami Muslim League formed at Rose Garden, Dhaka (President: Maulana Abdul Hamid Khan Bhashani); later renamed Awami League
21 February 1952	Language Movement martyrs (Salam, Barkat, Rafiq, Jabbar and others); Bangla became a state language of Pakistan in the 1956 constitution
March 1954	Provincial election — United Front (Jukta Front) wins a landslide; 21-point programme
1958	Martial law of Ayub Khan
17 September 1962	Education Movement (against the Sharif Commission report)
5 February 1966	Six-Point Programme placed by Sheikh Mujibur Rahman in Lahore — called the "Charter of Freedom (Magna Carta) of the Bengalis"; 7 June 1966 is Six-Point Day
1968	Agartala Conspiracy Case filed against Sheikh Mujib and others
1969	Mass upsurge; case withdrawn (22 Feb); title "Bangabandhu" given on 23 February 1969
7 December 1970	General election — Awami League wins 167 of 169 East Pakistan seats in the National Assembly (an absolute majority in Pakistan)

7.2.2 1971 — the Liberation War

Date	Event
2 March 1971	Flag of independent Bangladesh first hoisted at Dhaka University (by A. S. M. Abdur Rab)
7 March 1971	Bangabandhu's historic speech at the Racecourse (now Suhrawardy Udyan). UNESCO added it to the Memory of the World Register on 30 October 2017
25 March 1971 (night)	"Operation Searchlight" — genocide by the Pakistan army begins; 25 March is observed as Genocide Day (declared 2017)

26 March 1971	Declaration of independence — **Independence Day**
10 April 1971	Mujibnagar (Provisional) Government formed; Proclamation of Independence issued
17 April 1971	Oath of the Mujibnagar Government at Baidyanathtala mango grove, Meherpur (renamed Mujibnagar)
3 December 1971	Pakistan attacks India; full-scale war; joint command of Bangladesh–India allied forces
6 December 1971	India and Bhutan recognise Bangladesh (first recognitions)
14 December 1971	Mass killing of intellectuals — **Martyred Intellectuals Day**
16 December 1971	Pakistan army surrenders at the Racecourse — **Victory Day**. Lt Gen A. A. K. Niazi signed; Lt Gen Jagjit Singh Aurora accepted; Group Captain A. K. Khandker represented Bangladesh
10 January 1972	Bangabandhu returns to independent Bangladesh

7.2.3 Mujibnagar Government and war organisation

Post	Person
President	Sheikh Mujibur Rahman (in Pakistani custody)
Vice-President & Acting President	Syed Nazrul Islam
Prime Minister	Tajuddin Ahmad
Finance Minister	M. Mansur Ali
Home, Relief & Rehabilitation Minister	A. H. M. Qamaruzzaman
Foreign & Law Minister	Khondaker Mostaq Ahmad
Commander-in-Chief of the Liberation Forces	Colonel (later General) M. A. G. Osmani

- The Proclamation of Independence was read at the oath ceremony by **Professor M. Yusuf Ali**.
- The war area was divided into **11 sectors**. **Sector 10** was the naval commando sector, under the direct command of the C-in-C (no fixed sector commander).
- Three brigade-size forces were named after their commanders: **Z Force** (Ziaur Rahman), **K Force** (Khaled Mosharraf), **S Force** (K. M. Shafiullah).
- Gallantry awards (highest first): **Bir Sreshtho** (7 recipients, all martyrs) → Bir Uttom → Bir Bikrom → Bir Protik.
- The 7 Bir Sreshtho: Captain Mohiuddin Jahangir, Sepoy Hamidur Rahman, Sepoy Mostafa Kamal, ERA Mohammad Ruhul Amin, Flight Lieutenant Matiur Rahman, Lance Naik Munshi Abdur Rouf, Lance Naik Nur Mohammad Sheikh.

7.2.4 1972–1975 milestones

Date	Event

18 April 1972	Bangladesh joins the Commonwealth
4 November 1972	Constitution adopted by the Constituent Assembly (Constitution Day)
16 December 1972	Constitution comes into effect
7 March 1973	First parliamentary election of independent Bangladesh
February 1974	Joins the OIC (Lahore summit); Pakistan recognises Bangladesh in the same month
17 September 1974	Becomes the **136th member of the UN**; Bangabandhu addressed the UN General Assembly in Bangla on 25 September 1974
25 January 1975	Fourth Amendment — presidential, one-party system
15 August 1975	Bangabandhu Sheikh Mujibur Rahman assassinated with most of his family
3 November 1975	Jail killing — four national leaders (Syed Nazrul Islam, Tajuddin Ahmad, M. Mansur Ali, A. H. M. Qamaruzzaman) killed in Dhaka Central Jail

7.2.5 The Constitution

> **Core facts to memorise**
>
> Drafting committee: formed 11 April 1972, **34 members**, chaired by **Dr Kamal Hossain** (only woman member: Razia Banu) · Adopted **4 November 1972** · Effective **16 December 1972** · **11 Parts, 153 Articles** · originally 4 Schedules (the 15th Amendment added the 5th, 6th and 7th) · **17 amendments** so far · Original four fundamental principles: **nationalism, socialism, democracy, secularism** (Article 8).

Part	Subject	Articles
I	The Republic	1–7B
II	Fundamental Principles of State Policy	8–25
III	Fundamental Rights	26–47A
IV	The Executive	48–64
V	The Legislature	65–93
VI	The Judiciary	94–117
VII	Elections	118–126
VIII	Comptroller and Auditor-General	127–132
IX / IXA	Services of Bangladesh / Emergency Provisions	133–141 / 141A–141C
X	Amendment of the Constitution	142
XI	Miscellaneous	143–153

Article	Content	Article	Content
1	Name: People's Republic of Bangladesh	48	The President

2A	State religion (added by 8th Amendment, 1988)	55	The Cabinet, headed by the Prime Minister
3	State language: Bangla	64	Attorney-General
4	National anthem, flag and emblem	65	Parliament (Jatiya Sangsad): 300 directly elected seats + reserved women's seats
5	Capital: Dhaka	70	Vacation of seat on floor-crossing (anti-defection)
6	Citizenship	77	Ombudsman
7	Supremacy of the Constitution	81 / 87	Money Bill / Annual Financial Statement (budget)
11	Democracy and human rights	93	Ordinance-making power of the President
15 / 17	Basic necessities / Free and compulsory education	94	Supreme Court (Appellate + High Court Divisions)
18A	Protection of environment and biodiversity (15th Amendment)	102	Writ jurisdiction of the High Court Division
22	Separation of the judiciary from the executive	118	Election Commission
27	All citizens equal before law	127	Comptroller and Auditor-General
39	Freedom of thought, conscience and speech	137	Public Service Commission
44	Enforcement of fundamental rights	142	Amendment of the Constitution

Amendment	Year	Main point
1st	1973	Trial of war criminals (Article 47(3))
2nd	1973	Emergency provisions (Part IXA)
4th	1975	Presidential system and one-party rule
5th	1979	Validated martial-law actions of 1975–79 (later declared illegal by the courts)
7th	1986	Validated martial-law actions of 1982–86 (later declared illegal)
8th	1988	State religion; High Court benches outside Dhaka (bench part struck down in 1989)
12th	1991	Return to the parliamentary system
13th	1996	Non-party caretaker government
14th	2004	Women's reserved seats raised to 45
15th	2011	Caretaker system abolished; reserved women's seats 50; 5th–7th Schedules added
16th	2014	Parliament given power to remove judges (struck down by the Appellate Division, 2017)
17th	2018	Reserved women's seats (50) extended for 25 years

Verify latest

Since 2024 there have been court rulings on the 13th and 15th Amendments (caretaker system) and a national constitutional reform process (the "July Charter"). Changes are possible — check the latest position before the exam. The stable facts above (1972 dates, parts, original articles, amendments 1–17) are what MCQs usually test.

7.2.6 Geography

Item	Fact
Area	1,47,570 sq km (traditional official figure; some recent official sources give 1,48,460 sq km — verify which your exam uses)
Location	About 20°34′N–26°38′N and 88°01′E–92°41′E; the **Tropic of Cancer** passes through the middle of the country
Neighbours	India (west, north, east) and Myanmar (south-east); Bay of Bengal to the south
Land border (approx.)	India about 4,156 km; Myanmar about 271 km
Indian states on the border	5 — West Bengal, Assam, Meghalaya, Tripura, Mizoram
Districts bordering Myanmar	3 — Rangamati, Bandarban, Cox's Bazar (border river: Naf)
Divisions	8 — Dhaka, Chattogram, Rajshahi, Khulna, Barishal, Sylhet, Rangpur (2010), Mymensingh (2015, the newest). 64 districts (new divisions proposed — verify latest)
Largest / smallest district (area)	Rangamati / Narayanganj
Extreme points	North: Banglabandha (Tetulia, Panchagarh) · South: Chhera Dwip (south of Saint Martin's) · East: Akhainkom (Thanchi, Bandarban) · West: Monakosha (Shibganj, Chapainawabganj)
Highest peak	**Tajingdong (Bijoy), Bandarban** — the official textbook answer. Trap: Keokradong was the old answer; independent surveys show Saka Haphong (Mowdok range) is actually higher. In an MCQ, choose Tajingdong unless only Saka Haphong is offered.
Main rivers	Padma (the Ganges, enters through Chapainawabganj), Jamuna (main channel of the Brahmaputra, enters through Kurigram), Meghna (formed by the Surma and Kushiyara from the Barak, Sylhet), Teesta, Karnaphuli (Kaptai hydroelectric dam, 1962). Padma–Jamuna meet at Goalundo (Rajbari); Padma–Meghna meet at Chandpur
Transboundary rivers	57 — 54 with India and 3 with Myanmar
Islands	Largest: **Bhola** · only coral island: **Saint Martin's** · only hilly island: **Maheshkhali** · others: Sandwip, Hatiya, Nijhum Dwip (Noakhali), Kutubdia

Sundarbans	World's largest single tract of mangrove forest, shared with India (about 60% in Bangladesh — Khulna, Bagerhat, Satkhira). Home of the Royal Bengal Tiger; main tree Sundari. UNESCO World Heritage (1997); Ramsar site (1992)
Sea beaches	Cox's Bazar — longest unbroken natural sea beach (about 120 km); Kuakata (Patuakhali) — see both sunrise and sunset
Haors and lakes	Largest haor: Hakaluki (Moulvibazar–Sylhet); Tanguar Haor (Sunamganj) is a Ramsar site; largest (man-made) lake: Kaptai Lake
Hill Tracts	Rangamati, Khagrachhari, Bandarban; CHT Peace Accord signed 2 December 1997
Sea ports	Chattogram (largest), Mongla (Bagerhat, 1950), Payra (Patuakhali, the third); Matarbari deep sea port under construction
Maritime boundary	Verdict against Myanmar by ITLOS on 14 March 2012; against India by the Permanent Court of Arbitration on 7 July 2014
Enclaves	Land Boundary Agreement 1974 implemented 31 July/1 August 2015: 111 Indian enclaves became Bangladeshi, 51 Bangladeshi enclaves became Indian. Dahagram–Angarpota (Lalmonirhat) remains linked by the Tin Bigha Corridor
First tea garden	Malnicherra, Sylhet (1854)

UNESCO listing	Bangladesh items (year)
World Heritage Sites (3)	Historic Mosque City of Bagerhat (1985, cultural) · Ruins of the Buddhist Vihara at Paharpur, Naogaon (1985, cultural) · The Sundarbans (1997, natural)
Intangible Cultural Heritage	Baul songs (2008) · Jamdani weaving (2013) · Mangal Shobhajatra of Pahela Baishakh (2016) · Shital Pati weaving of Sylhet (2017) · Rickshaws and rickshaw painting in Dhaka (2023)
Memory of the World	7 March 1971 speech (2017)

7.2.7 National symbols and landmarks

Symbol	Fact	Symbol	Fact
National anthem	"Amar Shonar Bangla" — Rabindranath Tagore (written 1905, partition period); first 10 lines are sung	National song (war/march song)	"Chol Chol Chol" — Kazi Nazrul Islam
National poet	Kazi Nazrul Islam	National language	Bangla
National flag	Red circle on a bottle-green field; length:width = **10:6**; circle radius = 1/5 of length; centre slightly towards the hoist. Final design by Quamrul Hassan	National emblem	Water lily floating on water, flanked by sheaves of rice; above: three connected jute leaves and four stars
Flower	Water lily (shapla)	Fruit	Jackfruit
Tree	Mango tree	Animal	Royal Bengal Tiger

Bird	Magpie robin (doyel)	Fish	Hilsa (ilish)
Game	Kabaddi (ha-du-du)	National mosque	Baitul Mukarram, Dhaka
National Martyrs' Memorial (Savar)	Syed Mainul Hosain	Central Shaheed Minar	Hamidur Rahman
Jatiya Sangsad Bhaban	Louis I. Kahn (USA)	Aparajeyo Bangla (DU)	Syed Abdullah Khalid
Currency	Taka (BDT)	Calendar	Bangla year starts 14 April (Pahela Baishakh)

7.2.8 Bangladesh "firsts" (high-yield)

First …	Answer	First …	Answer
Computer	IBM 1620, Atomic Energy Centre, Dhaka, 1964	Private commercial bank	AB Bank, 1982
Submarine cable	SEA-ME-WE 4, 2006 (Cox's Bazar)	Islamic bank	Islami Bank Bangladesh, 1983
Communication satellite	Bangabandhu Satellite-1, 12 May 2018 (name may have changed — verify)	ATM	ANZ Grindlays Bank, 1992
Earthquake observatory	Chattogram, 1954	Mobile banking	Dutch-Bangla Bank, 2011
Metro rail	MRT Line-6, opened 28 December 2022	Bank of Bengali entrepreneurs	Eastern Mercantile Bank (Pubali), 1959
Underwater road tunnel	Karnaphuli tunnel, Chattogram, 2023 (first in South Asia)	Language Movement organisation	Tamaddun Majlis, 1947
Nuclear power plant	Rooppur, Ishwardi, Pabna	Deep sea port	Matarbari (under construction)
Export Processing Zone	Chattogram EPZ (1983)	Nobel laureate from Bangladesh	Dr Muhammad Yunus & Grameen Bank, Peace, 2006

7.3 Bangladesh economy and banking

7.3.1 Bangladesh Bank — the central bank

> **Establishment**
>
> Bangladesh Bank was established under the **Bangladesh Bank Order, 1972 (President's Order No. 127 of 1972)**, with effect from **16 December 1971**, by reorganising the Dhaka office of the State Bank of Pakistan. Head office: **Motijheel, Dhaka**. First Governor: **A. N. M. Hamidullah**. Current Governor: verify latest.

Function	What it means
Issue of currency	Sole issuer of bank notes signed by the Governor; the smallest denominations are government notes/coins signed by the Finance Secretary
Monetary policy	Controls money supply and interest rates to contain inflation; announces the Monetary Policy Statement (MPS), currently twice a year (verify latest)
Banker to the government	Keeps government accounts, manages public debt (treasury bills/bonds)
Banker's bank & lender of last resort	Holds banks' reserves (CRR), lends to banks in a liquidity crisis
Clearing house	Operates BACH, RTGS and NPSB; final inter-bank settlement in banks' current accounts with BB
Foreign exchange	Manages foreign exchange reserves and the exchange-rate regime; administers the Foreign Exchange Regulation Act 1947
Regulation & supervision	Licenses and supervises scheduled banks and finance companies under the Bank Company Act 1991 and the relevant finance-company law
AML/CFT	Houses the **BFIU** (Bangladesh Financial Intelligence Unit), which receives STRs/CTRs from reporting organisations

7.3.2 Types of banks

Type	Examples / notes
State-owned commercial banks (SOCBs)	Sonali, Janata, Agrani, Rupali, BASIC Bank, Bangladesh Development Bank (BDBL) (verify latest list)
State-owned specialised banks	Bangladesh Krishi Bank, Rajshahi Krishi Unnayan Bank (RAKUB) — agricultural credit
Private commercial banks (PCBs)	Conventional and Islamic Shariah-based; first PCB: AB Bank (1982); first Islamic: Islami Bank Bangladesh (1983)
Foreign commercial banks (FCBs)	Branches of foreign banks, e.g. Standard Chartered, HSBC

Digital banks	Branchless banks under BB's 2023 Digital Bank Guidelines (minimum paid-up capital Tk 125 crore); licences/approvals — verify latest
Specialised (own law)	Grameen Bank (Grameen Bank Ordinance 1983; Nobel Peace Prize 2006 with Dr Muhammad Yunus); Probashi Kallyan Bank; Karmasangsthan Bank; Palli Sanchay Bank

- **Scheduled bank**: a bank included in the list under **Article 37(2) of the Bangladesh Bank Order 1972**; it must keep CRR with Bangladesh Bank and can use its facilities (clearing, refinance). The number of scheduled banks changes with mergers and new licences (verify latest; several weak Islamic banks were merged in 2025).
- **Non-scheduled bank**: set up for a special purpose under its own law; not on the BB schedule.
- **Nationalisation**: in 1972 banks were nationalised by the Bangladesh Banks (Nationalisation) Order 1972 into six banks — Sonali, Janata, Agrani, Rupali, Pubali, Uttara (Pubali and Uttara were later denationalised).

7.3.3 Key laws (names and years)

Law	Year	Purpose / note
Negotiable Instruments Act	1881	Cheque, bill of exchange, promissory note; Section 138 — dishonour of cheque
Foreign Exchange Regulation Act	1947	Control of foreign exchange transactions
Bangladesh Bank Order (P.O. 127)	1972	Creates the central bank
Bank Company Act	1991	Main law for licensing and running banks (amended several times, including 2023)
Securities and Exchange Commission Act	1993	Created the SEC (now BSEC)
Bank Deposit Insurance Act	2000	Deposit insurance (replaced/updated recently — verify latest)
Artha Rin Adalat Ain (Money Loan Court Act)	2003	Special courts for recovery of bank loans
Microcredit Regulatory Authority Act	2006	Regulates NGO-MFIs
Anti-Terrorism Act	2009	Includes terrorist financing (amended 2012, 2013)
Insurance Act; IDRA Act	2010	Insurance regulation by IDRA
Money Laundering Prevention Act	**2012**	Current AML law (amended 2015). Earlier: MLP Act 2002 → Ordinance 2008 → Act 2009. BFIU formally created under the 2012 Act
Finance Company Act	2023	Replaced the Financial Institutions Act 1993; NBFIs now called finance companies
Income Tax Act	2023	Replaced the Income Tax Ordinance 1984

Name traps

It is the Money Laundering **Prevention** Act (not "Control"), the Bank **Company** Act (not "Banking Companies Act" — that is India's 1949 law), and the Bangladesh Bank **Order** (not Act). Banking reforms since 2024 (bank resolution, deposit protection, cyber law) issued new ordinances — verify names and years before the exam.

7.3.4 Payment infrastructure

System	Full form	Key point
BACH	Bangladesh Automated Clearing House	Umbrella of two systems: BACPS and BEFTN
BACPS	Bangladesh Automated Cheque Processing System (2010)	Cheque clearing using cheque image + MICR data (cheque truncation)
BEFTN	Bangladesh Electronic Funds Transfer Network (2011)	Batch credit/debit transfers — salary, dividend, utility bills; deferred net settlement
NPSB	National Payment Switch Bangladesh (2012)	Interoperability of ATM, POS and internet banking of different banks
RTGS	Real Time Gross Settlement (2015)	Each high-value payment settled individually and instantly
Bangla QR	National QR standard	One QR code accepted by any bank/MFS app
Binimoy	Interoperable Digital Transaction Platform	Transfers among banks, MFS and PSPs on one platform
Taka Pay	Domestic card scheme (2023)	Runs on NPSB; reduces dependence on foreign card schemes
MFS	Mobile Financial Services	Bank-led model; first: Dutch-Bangla Bank (2011); bKash launched 2011 (BRAC Bank subsidiary); Nagad is run with Bangladesh Post Office

Memory hook

BACPS **B**EFTN = **B**atch/net (2010, 2011) → NPSB = switch (2012) → RTGS = Real-time gross (2015). Ascending order of years matches the order you learn them.

7.3.5 Capital market and other regulators

Body	Fact
Dhaka Stock Exchange (DSE)	Incorporated 28 April 1954 (as East Pakistan Stock Exchange); formal trading from 1956. Indices: **DSEX** (broad, 2013), **DS30** (blue chip), **DSES** (Shariah)
Chittagong Stock Exchange (CSE)	1995; indices CASPI (all share) and CSE30

BSEC	Bangladesh Securities and Exchange Commission — formed 8 June 1993 under the SEC Act 1993; regulates the capital market
Demutualisation	Exchanges demutualised under the Exchanges Demutualization Act 2013 (ownership separated from trading rights)
CDBL	Central Depository Bangladesh Ltd — electronic (dematerialised) holding of shares
ICB	Investment Corporation of Bangladesh (1976) — state investment institution, mutual funds
IDRA	Insurance Development and Regulatory Authority — insurance regulator
MRA	Microcredit Regulatory Authority — regulates microfinance NGOs
NBR	National Board of Revenue (1972) — collects income tax, VAT and customs (restructuring under way — verify latest)

7.3.6 Mega projects (stable facts only)

Project	Stable facts
Padma Multipurpose Bridge	Opened **25 June 2022** (traffic from 26 June); **6.15 km**; two-level (road above, rail below); 41 spans, 42 piers; Mawa (Munshiganj) – Janjira (Shariatpur); built with Bangladesh's own funds; main bridge built by China Major Bridge Engineering Company. Rail link opened October 2023
Karnaphuli tunnel	First underwater road tunnel in South Asia; about 3.32 km; under the Karnaphuli river, Patenga–Anwara, Chattogram; opened 28 October 2023 (official name changed — verify latest)
Dhaka Metro Rail	MRT Line-6 (Uttara–Motijheel); first section Uttara North–Agargaon opened 28 December 2022; operated by DMTCL; financed mainly by JICA
Rooppur Nuclear Power Plant	Ishwardi, Pabna; 2 × 1,200 MW (VVER-1200) = 2,400 MW; built with Russia (Rosatom). Commissioning status — verify latest
Dhaka Elevated Expressway	First section (Airport–Farmgate) opened 2 September 2023
Bangabandhu (Jamuna) Bridge	Opened 23 June 1998; about 4.8 km; over the Jamuna (Tangail–Sirajganj). A separate dedicated Jamuna rail bridge opened in 2025 (verify)
Matarbari	Deep sea port and 1,200 MW coal power plant, Maheshkhali, Cox's Bazar (JICA)
Bangabandhu Satellite-1	Launched 12 May 2018 by SpaceX Falcon 9 from Florida; built by Thales Alenia Space; orbital slot 119.1° East

Names may have changed

Several projects, institutions and days named after political leaders were renamed after August 2024. If an MCQ shows both old and new names, both refer to the same thing — choose the option that matches the stable fact (place, year, length).

7.3.7 Economy basics (stable concepts)

- **Fiscal year**: 1 July – 30 June. The budget is placed in Parliament in June (Article 87: Annual Financial Statement).
- **LDC graduation**: Bangladesh met all three criteria (GNI per capita, Human Assets Index, Economic Vulnerability Index) in 2018 and again in 2021; UN approved graduation in November 2021, scheduled for **24 November 2026** (verify latest — deferral was debated).
- **Largest export**: readymade garments (RMG). **Largest source of foreign exchange after exports**: remittance. Main export markets: EU and USA.
- **Export Processing Zones** are run by BEPZA; first EPZ: Chattogram (1983). Economic zones: BEZA.
- Figures such as GDP growth, per-capita income, inflation, reserves and budget size change every year — verify latest.

7.4 International organisations, countries and days

7.4.1 United Nations

> **UN at a glance**
>
> Charter signed **26 June 1945** (San Francisco) · came into force **24 October 1945** (UN Day) · HQ **New York** · **193** members (193rd: South Sudan, 2011) · **6 official languages**: Arabic, Chinese, English, French, Russian, Spanish · Bangladesh joined 17 September 1974 (136th) · Secretary-General: verify latest (5-year term; appointed by the General Assembly on the Security Council's recommendation).

Principal organ (6)	Key facts
General Assembly	All 193 members, one vote each
Security Council	15 members — 5 permanent with veto (USA, UK, France, Russia, China) + 10 non-permanent elected for 2 years
Economic and Social Council (ECOSOC)	54 members; coordinates economic and social work
Trusteeship Council	Suspended operations in 1994 (after Palau's independence)
International Court of Justice	The Hague, Netherlands; 15 judges, 9-year terms (the only principal organ not in New York)
Secretariat	Headed by the Secretary-General

Agency	HQ	Agency	HQ
FAO	Rome	UNESCO	Paris
IFAD	Rome	UNICEF	New York
WFP	Rome	UNDP	New York
WHO	Geneva	UNFPA	New York
ILO	Geneva	UN Women	New York

WIPO	Geneva	IAEA	Vienna
ITU	Geneva	UNIDO	Vienna
WMO	Geneva	UNODC	Vienna
UNHCR	Geneva	ICAO	Montreal
UNCTAD	Geneva	IMO	London
UNEP	Nairobi	UPU	Bern
UN-Habitat	Nairobi	UN University	Tokyo
IMF	Washington, D.C.	World Bank	Washington, D.C.

Memory hook

Rome = food (FAO, IFAD, WFP) · **Vienna = atoms & industry & drugs** (IAEA, UNIDO, UNODC) · **Nairobi = environment & housing** (UNEP, UN-Habitat) · **Geneva = most technical bodies** (WHO, ILO, ITU, WIPO, WMO, UNHCR, WTO) · **New York = children, development, population, women**.

7.4.2 Financial and trade institutions

Institution	Founded	HQ	Notes
IMF	1944 Bretton Woods conference; established December 1945	Washington, D.C.	Balance-of-payments support; SDR (basket: US dollar, euro, Chinese yuan, Japanese yen, pound sterling); reports: **World Economic Outlook**, Global Financial Stability Report
World Bank (IBRD)	1944 Bretton Woods; established 1945	Washington, D.C.	World Bank Group = IBRD, IDA, IFC, MIGA, ICSID; reports: World Development Report, Global Economic Prospects
ADB	1966	Manila	Asian Development Bank; Bangladesh joined 1973
Islamic Development Bank	1973 (operations 1975)	Jeddah	OIC-linked development bank
AIIB	2015 (operations January 2016)	Beijing	Asian Infrastructure Investment Bank; Bangladesh a founding member
NDB	2014 agreement (BRICS)	Shanghai	New Development Bank ("BRICS bank"); Bangladesh joined 2021
WTO	1 January 1995 (replaced GATT, 1947)	Geneva	Bangladesh a founding member; not a UN agency
BIS	1930	Basel	"Central bank of central banks"; hosts the Basel Committee (Basel I, II, III)
SWIFT	1973	La Hulpe, Belgium	Secure financial messaging (not money transfer itself)

FATF	1989	Paris (OECD)	Global AML/CFT standard setter; Bangladesh is assessed through the APG (Asia/Pacific Group on Money Laundering)

7.4.3 Regional and other bodies

Body	Founded	HQ / Secretariat	Members / notes
SAARC	8 December 1985, Dhaka	Kathmandu	8: Bangladesh, India, Pakistan, Nepal, Bhutan, Sri Lanka, Maldives, Afghanistan (joined 2007); SAFTA in force 2006
BIMSTEC	6 June 1997, Bangkok Declaration	**Dhaka**	7: Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, Thailand (Bay of Bengal countries)
ASEAN	8 August 1967, Bangkok	Jakarta	Founders: Indonesia, Malaysia, Philippines, Singapore, Thailand; Timor-Leste became the 11th member in 2025 (verify). Bangladesh is a member of the ASEAN Regional Forum, not ASEAN
OIC	1969, Rabat	Jeddah	57 members; renamed Organisation of Islamic Cooperation (2011); Bangladesh joined 1974
D-8	15 June 1997, Istanbul	Istanbul	Developing-8: Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Pakistan, Turkey (Azerbaijan admitted 2024 — verify)
Commonwealth	1949 (London Declaration)	London (Marlborough House)	Mostly former British territories; 56 members (verify); Bangladesh joined 18 April 1972
CIRDAP	1979	**Dhaka**	Rural development, Asia-Pacific
NAM	1961, Belgrade	No permanent HQ	Non-Aligned Movement
OPEC	1960, Baghdad	Vienna	Oil exporters
EU	Maastricht Treaty (in force 1993)	Brussels	Euro introduced 1999 (notes/coins 2002); grants GSP/GSP+
NATO	1949	Brussels	Military alliance
SCO	2001	Beijing	Shanghai Cooperation Organisation
African Union	2002	Addis Ababa	Successor of the OAU (1963)
Arab League	1945	Cairo	—
APEC	1989	Singapore	Asia-Pacific Economic Cooperation
Interpol	1923	Lyon	International police cooperation
ICRC	1863	Geneva	International Committee of the Red Cross

Transparency International	1993	Berlin	Publishes the Corruption Perceptions Index (CPI)
Amnesty International	1961	London	Human rights
World Economic Forum	1971	Geneva (Cologny)	Global Gender Gap Report, Global Risks Report; Davos meeting
FIFA / IOC / ICC (cricket)	1904 / 1894 / 1909	Zurich / Lausanne / Dubai	Sports bodies

Report	Publisher	Report	Publisher
World Economic Outlook	IMF	Human Development Report	UNDP
Global Financial Stability Report	IMF	World Investment Report	UNCTAD
World Development Report	World Bank	Corruption Perceptions Index	Transparency International
Global Economic Prospects	World Bank	Global Gender Gap Report	World Economic Forum
World Trade Report	WTO	State of the World's Children	UNICEF

7.4.4 Capitals and currencies

Country	Capital	Currency	Country	Capital	Currency
India	New Delhi	Rupee	Myanmar	Naypyidaw	Kyat
Nepal	Kathmandu	Rupee	Bhutan	Thimphu	Ngultrum
Sri Lanka	Sri Jayawardenepura Kotte (Colombo commercial)	Rupee	Maldives	Male	Rufiyaa
Pakistan	Islamabad	Rupee	Afghanistan	Kabul	Afghani
China	Beijing	Yuan (Renminbi)	Japan	Tokyo	Yen
South Korea	Seoul	Won	North Korea	Pyongyang	Won
Thailand	Bangkok	Baht	Malaysia	Kuala Lumpur	Ringgit
Indonesia	Jakarta (move to Nusantara under way — verify)	Rupiah	Singapore	Singapore	Singapore dollar
Philippines	Manila	Peso	Vietnam	Hanoi	Dong
Cambodia	Phnom Penh	Riel	Laos	Vientiane	Kip
Saudi Arabia	Riyadh	Riyal	UAE	Abu Dhabi	Dirham
Qatar	Doha	Riyal	Kuwait	Kuwait City	Dinar
Oman	Muscat	Rial	Bahrain	Manama	Dinar
Iran	Tehran	Rial	Iraq	Baghdad	Dinar

Turkey (Turkiye)	Ankara	Lira	Egypt	Cairo	Pound
United Kingdom	London	Pound sterling	France	Paris	Euro
Germany	Berlin	Euro	Italy	Rome	Euro
Russia	Moscow	Ruble	Switzerland	Bern	Swiss franc
USA	Washington, D.C.	Dollar	Canada	Ottawa	Canadian dollar
Brazil	Brasilia	Real	Mexico	Mexico City	Peso
Australia	Canberra	Australian dollar	New Zealand	Wellington	NZ dollar
South Africa	Pretoria (executive); Cape Town, Bloemfontein	Rand	Nigeria	Abuja	Naira
Kenya	Nairobi	Shilling	Kazakhstan	Astana	Tenge

Capital traps

Myanmar — Naypyidaw (not Yangon); Sri Lanka — Sri Jayawardenepura Kotte (not Colombo); Australia — Canberra (not Sydney); Canada — Ottawa (not Toronto); Turkey — Ankara (not Istanbul); Brazil — Brasilia (not Rio); Nigeria — Abuja (not Lagos); Switzerland — Bern (not Geneva/Zurich).

7.4.5 Important days

Date	Day	Date	Day
21 February	International Mother Language Day (UNESCO declared 17 Nov 1999; observed from 2000) / Shaheed Day	3 May	World Press Freedom Day
8 March	International Women's Day	17 May	World Telecommunication and Information Society Day
15 March	World Consumer Rights Day	31 May	World No Tobacco Day
22 March	World Water Day	5 June	World Environment Day
23 March	World Meteorological Day	12 June	World Day Against Child Labour
25 March	Genocide Day (Bangladesh)	20 June	World Refugee Day
26 March	Independence and National Day (Bangladesh)	26 June	International Day against Drug Abuse
7 April	World Health Day	11 July	World Population Day
14 April	Pahela Baishakh (Bangla New Year)	12 August	International Youth Day
22 April	Earth Day	8 September	International Literacy Day

23 April	World Book and Copyright Day	16 September	World Ozone Day
1 May	May Day (International Workers' Day)	21 September	International Day of Peace
27 September	World Tourism Day	5 October	World Teachers' Day
16 October	World Food Day	24 October	United Nations Day
31 October	World Savings (Thrift) Day	1 December	World AIDS Day
4 December	**International Day of Banks** (UN, from 2019)	9 December	International Anti-Corruption Day
10 December	Human Rights Day	14 / 16 December	Martyred Intellectuals Day / Victory Day (Bangladesh)

7.5 Banking and finance terms (one line each)

Rates set by Bangladesh Bank (CRR, SLR, policy rate) change often — learn the **definition**; for the current number, verify latest.

Term	Meaning
CRR (Cash Reserve Ratio)	Share of a bank's total demand and time liabilities it must keep as cash with the central bank (earns no return)
SLR (Statutory Liquidity Ratio)	Share of liabilities a bank must hold in liquid assets (cash, gold, approved government securities) — kept by the bank itself
Repo	Central bank lends to banks against government securities with an agreement to buy them back; in Bangladesh the repo rate is the policy rate
Reverse repo	Banks park surplus funds with the central bank against securities — absorbs liquidity
Bank rate	Rate at which the central bank rediscounts bills/lends to banks (a signalling rate)
Open Market Operation (OMO)	Central bank buys/sells government securities to inject/absorb money
Contractionary / expansionary policy	Raise rates/reserves to fight inflation / cut them to boost growth
Inflation / deflation / stagflation	General price rise / general price fall / high inflation with low growth and high unemployment
NPL (Non-Performing Loan)	A loan whose interest/principal is overdue beyond the set period; in Bangladesh "classified loan"
Loan classification	Unclassified (Standard, SMA) and classified: Sub-standard (SS), Doubtful (DF), Bad/Loss (BL)
Provision	Money set aside from profit against possible loan losses

Rescheduling / write-off	Re-setting repayment terms of a defaulted loan / removing a fully provided bad loan from the balance sheet (recovery efforts continue)
CAR / CRAR	Capital to Risk-weighted Assets Ratio — capital ÷ risk-weighted assets
Basel III	Global bank capital and liquidity standard by the Basel Committee (BIS): minimum CET1 4.5%, Tier 1 6%, total capital 8% + 2.5% capital conservation buffer; leverage ratio; LCR and NSFR (Bangladesh's own minimums — verify latest)
Three pillars (Basel II/III)	Pillar 1 minimum capital · Pillar 2 supervisory review · Pillar 3 market discipline (disclosure)
Tier 1 / Tier 2 capital	Core capital (paid-up capital, reserves, retained earnings) / supplementary capital (general provisions, subordinated debt)
LCR	Liquidity Coverage Ratio — high-quality liquid assets ÷ 30-day net cash outflow ≥ 100%
NSFR	Net Stable Funding Ratio — available stable funding ÷ required stable funding > 100% (one-year horizon)
CAMELS	Bank rating: Capital adequacy, Asset quality, Management, Earnings, Liquidity, Sensitivity to market risk
KYC / e-KYC	Know Your Customer — verify identity and profile; e-KYC does it digitally (NID + photo/biometrics)
CDD / EDD	Customer Due Diligence / Enhanced Due Diligence for high-risk customers
PEP	Politically Exposed Person — high-risk customer needing EDD
AML/CFT	Anti-Money Laundering / Combating the Financing of Terrorism
Money laundering stages	Placement → Layering → Integration
STR / SAR	Suspicious Transaction / Activity Report — sent to BFIU
CTR	Cash Transaction Report — cash transactions above the BFIU threshold, reported regularly
FATF	Financial Action Task Force — sets 40 Recommendations on AML/CFT
SWIFT	Society for Worldwide Interbank Financial Telecommunication — secure messaging network for banks; each bank has a BIC (SWIFT code) of 8 or 11 characters
Letter of Credit (LC)	Bank's written undertaking to pay the seller (beneficiary) on presentation of complying documents; governed by **UCP 600** (ICC, 2007)
LC types	Irrevocable (all LCs under UCP 600 are irrevocable), confirmed, sight (pay on sight), usance/deferred (pay later), back-to-back (second LC backed by the first — common in RMG), transferable, revolving, red clause (advance to seller), standby (guarantee-like)
Incoterms	ICC rules on delivery responsibilities, e.g. FOB (Free On Board), CIF (Cost, Insurance and Freight)

Bill of exchange / promissory note	Unconditional order to pay (3 parties) / unconditional promise to pay (2 parties)
Cheque crossing	Two parallel lines — amount must be paid into a bank account, not in cash over the counter
Overdraft / Cash credit	Withdraw beyond balance on a current account / running loan against stock or other security
Collateral, hypothecation, pledge, mortgage, lien	Security for a loan / charge on movable goods kept by borrower / goods delivered to the lender / charge on immovable property / right to retain property until debt is paid
Call money	Overnight inter-bank borrowing/lending
Treasury bill / bond	Short-term (up to 1 year) / long-term government debt securities
Sukuk	Shariah-compliant bond backed by assets
Islamic modes	Mudaraba (profit-sharing; bank gives capital), Musharaka (partnership), Murabaha (cost-plus sale), Bai-Muajjal (deferred-payment sale), Ijarah (leasing)
Lender of last resort	Central bank's role of lending to a solvent bank facing a liquidity crisis
Deposit insurance	Protection of small depositors up to a limit if a bank fails (limit — verify latest)
Agent banking	Banking services through appointed agents in rural areas (Bangladesh Bank guidelines issued in 2013)
Bancassurance	Bank selling insurance products of an insurance company
Dormant account	Account with no customer-initiated transaction for a long period
Remittance / Hundi	Money sent by expatriates through formal channels / illegal informal transfer channel
Fintech / RegTech	Technology-based financial services / technology for regulatory compliance
CBDC	Central Bank Digital Currency — digital form of legal tender issued by a central bank
Escrow	Funds held by a third party until agreed conditions are met
Devaluation / depreciation	Official cut in currency value under a fixed regime / market-driven fall in value
Balance of Payments	Record of all transactions with the rest of the world: current account + capital & financial account
GDP / GNI	Value of output produced inside the country / GDP + net income from abroad
FDI	Foreign Direct Investment — long-term foreign ownership/control in a business
Credit rating	Assessment of creditworthiness (e.g. Moody's, S&P, Fitch internationally)

7.6 ICT and science GK

Question	Answer	Question	Answer

Father of the computer	Charles Babbage	First programmer	Ada Lovelace
First general-purpose electronic computer	ENIAC (1946)	Transistor invented	1947, Bell Labs (Bardeen, Brattain, Shockley)
Integrated circuit	Jack Kilby (1958)	First microprocessor	Intel 4004 (1971), 4-bit
Intel 8086	16-bit; 20-bit address bus (1 MB)	Forerunner of the Internet	ARPANET (1969)
World Wide Web	Tim Berners-Lee, CERN (1989)	Email (network)	Ray Tomlinson (1971)
TCP/IP	Vint Cerf and Bob Kahn	C language	Dennis Ritchie (1972)
Java	James Gosling, Sun (1995)	Python	Guido van Rossum (1991)
Linux	Linus Torvalds (1991)	OSI model layers	7
1 byte / 1 KB	8 bits / 1024 bytes	Wi-Fi / Ethernet standard	IEEE 802.11 / IEEE 802.3
First computer in Bangladesh	IBM 1620, 1964, Atomic Energy Centre, Dhaka	Internet (online) in Bangladesh	1996 (VSAT)
First mobile operator in Bangladesh	Citycell (1993)	4G in Bangladesh	February 2018
5G trial in Bangladesh	Teletalk, December 2021	Telecom regulator	BTRC (2002, under the Bangladesh Telecommunication Act 2001)
Country-code domain	.bd (plus a Bangla-script internationalised domain)	ICT Act	Information and Communication Technology Act 2006
Submarine cables	SEA-ME-WE 4 (2006, Cox's Bazar), SEA-ME-WE 5 (2017, Kuakata)	Satellite	Bangabandhu Satellite-1, 12 May 2018
Speed of light (vacuum)	About 3×10^8 m/s	Speed of sound in air	About 332 m/s at 0 °C (about 343 m/s at 20 °C)
Sunlight reaches Earth in	About 8 minutes 20 seconds	Largest / smallest planet	Jupiter / Mercury
Hottest planet	Venus	Red planet	Mars
Most abundant gas in air	Nitrogen (about 78%)	Ozone layer	In the stratosphere; absorbs ultraviolet rays
Laughing gas	Nitrous oxide (N_2O)	Hardest natural substance	Diamond

pH of pure water	7 (neutral)	Water is densest at	4 °C
Absolute zero	0 K = −273.15 °C	Normal body temperature	About 37 °C (98.4 °F)
Dynamite	Alfred Nobel	Penicillin	Alexander Fleming (1928)
Telephone	Alexander Graham Bell (1876)	X-ray	Wilhelm Röntgen (1895)
Electron / proton / neutron	J. J. Thomson / Rutherford / Chadwick	Theory of relativity	Albert Einstein
DNA double helix	Watson and Crick (1953)	Blood groups	Karl Landsteiner
Insulin discovered	Banting and Best (1921)	Vitamin C deficiency	Scurvy
Vitamin D deficiency	Rickets	Vitamin A deficiency	Night blindness
Vitamin K	Needed for blood clotting	Galvanising	Coating iron with zinc
Satyendra Nath Bose	Bose–Einstein statistics; "boson" named after him; taught at Dhaka University	Jagadish Chandra Bose	Radio/microwave research; showed plant response (crescograph)
Mercurous nitrite	Acharya P. C. Ray (1896)	Earthquake measurement	Richter scale; instrument: seismograph
SI units	Force newton, energy joule, power watt	SI units	Current ampere, resistance ohm, frequency hertz
Terracotta	Baked clay	"Tsunami"	Japanese word for harbour wave

7.7 Practice MCQ

Answer in 30 seconds each. Questions marked with a source tag are real past questions.

1. Bangladesh Bank was established under which law?

(a) Bangladesh Bank Act 1971 (b) Bangladesh Bank Order 1972
(c) Bank Company Act 1991 (d) Banking Companies Ordinance 1962

Answer: (b) — President's Order No. 127 of 1972, effective from 16 December 1971.

2. Who is called the "Clearing House" of banks in Bangladesh?

(a) Sonali Bank (b) Ministry of Finance
(c) Bangladesh Bank (d) BSEC

Answer: (c) — it runs BACH and settles inter-bank dues. Officer IT 2026 (25105)

3. Which is the first private commercial bank of Bangladesh?

(a) IFIC Bank
(b) AB Bank
(c) City Bank
(d) Islami Bank

Answer: (b) — 1982. Officer IT 2026 (25105)

4. What is the full form of NPSB?

(a) National Payment System Bangladesh
(b) National Payment Switch Bangladesh
(c) National Pay Service Board
(d) Network Payment Switch Bangladesh

Answer: (b) SO IT 2026 (25104)

5. Where was the first computer of Bangladesh installed?

(a) Dhaka University
(b) BUET
(c) Atomic Energy Centre, Dhaka
(d) BCSIR

Answer: (c) — IBM 1620, 1964. Officer IT MCQ 2026 (BIBM)

6. Bangladesh's first submarine cable is —

(a) SEA-ME-WE 3
(b) SEA-ME-WE 4
(c) SEA-ME-WE 5
(d) SEA-ME-WE 6

Answer: (b) — 2006, Cox's Bazar. SO IT 2026 (25104)

7. The Tin Bigha Corridor is in which district?

(a) Panchagarh
(b) Nilphamari
(c) Lalmonirhat
(d) Kurigram

Answer: (c) — Patgram upazila. Officer IT MCQ 2026 (BIBM)

8. The first organisation of the Language Movement was —

(a) Awami Muslim League
(b) Tamaddun Majlis
(c) Chhatra League
(d) Rashtrabhasha Sangram Parishad

Answer: (b) — formed 1 September 1947. Officer IT MCQ 2026 (BIBM)

9. International Literacy Day is observed on —

(a) 8 March
(b) 5 June
(c) 8 September
(d) 5 October

Answer: (c) Officer IT MCQ 2026 (BIBM)

10. Where is the headquarters of CIRDAP?

(a) Dhaka
(b) Manila
(c) Kathmandu
(d) Bangkok

Answer: (a) BSCS AP 03.01.2026

11. Which organisation grants the GSP+ facility?

(a) WTO
(b) USA
(c) European Union
(d) World Bank

Answer: (c) BSCS AP 03.01.2026

12. The "World Economic Outlook" is published by —

(a) World Bank (b) IMF
(c) WTO (d) UNDP

Answer: (b) SO IT 2026 (25104)

13. Which country has the longest coastline in the world?

(a) Russia (b) Indonesia
(c) Australia (d) Canada

Answer: (d) Officer IT 2026 (25105)

14. The Constitution of Bangladesh came into effect on —

(a) 26 March 1972 (b) 4 November 1972
(c) 16 December 1972 (d) 10 April 1971

Answer: (c) — adopted 4 November 1972; effective 16 December 1972.

15. How many articles are in the Constitution of Bangladesh?

(a) 142 (b) 150
(c) 153 (d) 156

Answer: (c) — in 11 parts.

16. Which article of the Constitution declares Bangla the state language?

(a) Article 1 (b) Article 3
(c) Article 5 (d) Article 7

Answer: (b)

17. The non-party caretaker government system was introduced by which amendment?

(a) 12th (b) 13th
(c) 14th (d) 15th

Answer: (b) — 1996; abolished by the 15th (2011).

18. Where did the Mujibnagar Government take oath?

(a) Chuadanga (b) Kushtia
(c) Meherpur (d) Jashore

Answer: (c) — Baidyanathtala, 17 April 1971.

19. Who was the Prime Minister of the Mujibnagar Government?

(a) Syed Nazrul Islam (b) Tajuddin Ahmad
(c) M. Mansur Ali (d) A. H. M. Qamaruzzaman

Answer: (b) — Syed Nazrul Islam was Acting President.

20. Into how many sectors was the Liberation War area divided?

(a) 7 (b) 9
(c) 11 (d) 13

Answer: (c) — Sector 10 was the naval sector.

21. Bangladesh became a member of the United Nations on —

(a) 16 December 1972 (b) 17 September 1974
(c) 25 September 1974 (d) 24 October 1975

Answer: (b) — 136th member; (c) is the date of Bangabandhu's Bangla speech at the UNGA.

22. The Six-Point Programme was placed in —

(a) 1962 (b) 1966
(c) 1969 (d) 1970

Answer: (b) — Lahore, 5 February 1966.

23. The only coral island of Bangladesh is —

(a) Maheshkhali (b) Saint Martin's
(c) Nijhum Dwip (d) Kutubdia

Answer: (b) Officer IT 2026 (25105)

24. Which is Bangladesh's newest division?

(a) Rangpur (b) Sylhet
(c) Barishal (d) Mymensingh

Answer: (d) — 2015 (verify if a new division has since been created).

25. How many UNESCO World Heritage Sites does Bangladesh have?

(a) 2 (b) 3
(c) 4 (d) 5

Answer: (b) — Bagerhat Mosque City, Paharpur Vihara, Sundarbans.

26. Who is the architect of the National Martyrs' Memorial at Savar?

(a) Hamidur Rahman (b) Louis I. Kahn
(c) Syed Mainul Hosain (d) Syed Abdullah Khalid

Answer: (c) SO IT 2026 (25104)

27. The ratio of length to width of the national flag is —

(a) 3:2 (b) 10:6
(c) 11:7 (d) 4:3

Answer: (b) — circle radius is one-fifth of the length.

28. The Padma Bridge was opened on —

(a) 16 December 2021 (b) 25 June 2022
(c) 28 December 2022 (d) 28 October 2023

Answer: (b) — (c) is metro rail, (d) is the Karnaphuli tunnel.

29. The Rooppur Nuclear Power Plant is in which district?

(a) Pabna (b) Kushtia
(c) Natore (d) Sirajganj

Answer: (a) — Ishwardi upazila.

30. In which system is each high-value transaction settled individually and instantly?

(a) BEFTN
(b) BACPS
(c) RTGS
(d) Bangla QR

Answer: (c) — Real Time Gross Settlement.

31. A bank's Suspicious Transaction Report (STR) is sent to —

(a) BTRC
(b) BFIU
(c) BSEC
(d) NBR

Answer: (b) — Bangladesh Financial Intelligence Unit.

32. The current money laundering law of Bangladesh is the —

(a) Money Laundering Control Act 2002
(b) Money Laundering Prevention Act 2012
(c) Anti-Terrorism Act 2009
(d) Bank Company Act 1991

Answer: (b) — amended 2015.

33. In CAMELS, the letter "S" stands for —

(a) Solvency
(b) Security
(c) Sensitivity to market risk
(d) Supervision

Answer: (c)

34. Which rules govern documentary letters of credit?

(a) Incoterms 2020
(b) UCP 600
(c) Basel III
(d) ISO 20022

Answer: (b) — ICC; under UCP 600 every LC is irrevocable.

35. If the central bank raises the CRR, money supply will —

(a) increase
(b) decrease
(c) stay the same
(d) double

Answer: (b) — banks have less money to lend.

36. Where is the headquarters of BIMSTEC?

(a) Bangkok
(b) Kathmandu
(c) Dhaka
(d) Colombo

Answer: (c)

37. The headquarters of the Asian Development Bank is in —

(a) Tokyo
(b) Manila
(c) Beijing
(d) Singapore

Answer: (b) — AIIB is in Beijing; NDB in Shanghai.

38. Which UN body is headquartered in Rome?

(a) UNESCO
(b) FAO
(c) ILO
(d) UNEP

Answer: (b) — UNESCO Paris, ILO Geneva, UNEP Nairobi.

39. How many permanent members does the UN Security Council have?

(a) 5 (b) 10
(c) 15 (d) 193

Answer: (a) — each has veto power.

40. The capital of Myanmar is —

(a) Yangon (b) Mandalay
(c) Naypyidaw (d) Sittwe

Answer: (c)

41. The currency of Bhutan is —

(a) Rupee (b) Ngultrum
(c) Kyat (d) Rufiyaa

Answer: (b) — Kyat: Myanmar; Rufiyaa: Maldives.

42. The WTO came into existence in —

(a) 1947 (b) 1985
(c) 1995 (d) 2001

Answer: (c) — 1 January 1995, replacing GATT (1947).

43. Who invented dynamite?

(a) Alfred Nobel (b) Thomas Edison
(c) Michael Faraday (d) James Watt

Answer: (a) BSCS AP 03.01.2026

44. Who discovered mercurous nitrite?

(a) J. C. Bose (b) S. N. Bose
(c) P. C. Ray (d) C. V. Raman

Answer: (c) Officer IT MCQ 2026 (BIBM)

45. Rabindranath Tagore won the Nobel Prize in —

(a) 1905 (b) 1913
(c) 1921 (d) 1941

Answer: (b) — Literature, for Gitanjali. Officer IT 2026 (25105)

46. The 8086 microprocessor is —

(a) 4-bit (b) 8-bit
(c) 16-bit (d) 32-bit

Answer: (c) Officer IT 2026 (25105)

47. The World Wide Web was invented by —

(a) Vint Cerf (b) Tim Berners-Lee
(c) Bill Gates (d) Ray Tomlinson

Answer: (b) — at CERN, 1989.

48. "International Day of Banks" (UN) is observed on —

(a) 31 October (b) 24 October

(c) 4 December (d) 10 December

Answer: (c) — 31 October is World Savings Day.

7.8 Written-style short questions and answers

For written GK, give the answer plus one supporting fact in a single line — that earns full marks and shows certainty.

1. **When and under which law was Bangladesh Bank established?** — Under the Bangladesh Bank Order 1972 (P.O. No. 127), with effect from 16 December 1971; head office Motijheel, Dhaka.
2. **What is a scheduled bank?** — A bank included in the list under Article 37(2) of the Bangladesh Bank Order 1972; it keeps CRR with Bangladesh Bank and uses its clearing and refinance facilities.
3. **Write the full forms: BEFTN, RTGS, BACH.** — Bangladesh Electronic Funds Transfer Network; Real Time Gross Settlement; Bangladesh Automated Clearing House.
4. **Difference between RTGS and BEFTN.** — RTGS settles each payment individually and instantly (gross, real-time, high value); BEFTN processes payments in batches and settles the net amount at set times (salary, dividends).
5. **What is CRR?** — The percentage of a bank's total demand and time liabilities that must be kept as cash with Bangladesh Bank; raising it reduces the money banks can lend.
6. **What is SLR?** — The percentage of liabilities a bank must hold in liquid assets (cash, gold, approved government securities) to remain solvent.
7. **What is the repo rate?** — The rate at which the central bank lends to banks against government securities with a repurchase agreement; Bangladesh Bank's policy rate.
8. **Name the three stages of money laundering.** — Placement, Layering, Integration.
9. **What is BFIU?** — Bangladesh Financial Intelligence Unit — the national agency under Bangladesh Bank that receives and analyses STRs/CTRs to fight money laundering and terrorist financing.
10. **What is Basel III?** — The Basel Committee's global framework (after the 2008 crisis) that sets higher bank capital (CET1, buffers), a leverage ratio and liquidity ratios (LCR, NSFR).
11. **Expand CAMELS.** — Capital adequacy, Asset quality, Management, Earnings, Liquidity, Sensitivity to market risk.
12. **What is a back-to-back LC?** — A second LC opened on the strength of an export (master) LC, used by RMG exporters to import raw materials.
13. **What is SWIFT?** — Society for Worldwide Interbank Financial Telecommunication (1973, Belgium) — a secure messaging network banks use to send payment instructions.
14. **What is CBDC?** — Central Bank Digital Currency: a digital form of legal tender issued and backed by the central bank.
15. **When were the Constitution of Bangladesh adopted and made effective?** — Adopted 4 November 1972; effective 16 December 1972 (drafting committee chaired by Dr Kamal Hossain).
16. **Name the four fundamental principles of state policy in the original Constitution.** — Nationalism, socialism, democracy and secularism (Article 8).

17. **When and where was the Mujibnagar Government sworn in?** — 17 April 1971 at Baidyanathtala, Meherpur (formed 10 April 1971).
18. **Name the three UNESCO World Heritage Sites of Bangladesh.** — Historic Mosque City of Bagerhat (1985), Ruins of the Buddhist Vihara at Paharpur (1985), the Sundarbans (1997).
19. **Which international recognition did the 7 March speech receive?** — UNESCO's Memory of the World Register, 30 October 2017.
20. **When was the Padma Bridge opened and how long is it?** — 25 June 2022; 6.15 km two-level road-rail bridge between Mawa and Janjira, built with Bangladesh's own funds.
21. **Name the publishers of the World Economic Outlook and the World Development Report.** — IMF and World Bank respectively; both headquartered in Washington, D.C.
22. **Where are the headquarters of SAARC and BIMSTEC?** — Kathmandu (Nepal) and Dhaka (Bangladesh).
23. **What is the full form of WIPO and where is it based?** — World Intellectual Property Organization, Geneva.
24. **What is GSP+ and why does it matter for Bangladesh?** — EU's special incentive tariff scheme for developing countries that ratify core conventions; it can keep duty-free access for Bangladeshi exports after LDC graduation.

> **Last-day GK checklist**
>
> 1) Names of current office-holders (President, Chief Adviser/Prime Minister, Governor of Bangladesh Bank, UN Secretary-General, heads of IMF/World Bank) · 2) Current policy rate, CRR, SLR · 3) Latest budget size and fiscal year · 4) Recent sports winners and international summits · 5) Any renamed projects or new divisions — all **verify latest**.

Chapter 8 — Model Tests and Final Checklist

Each model test copies the non-tech share of the 31 October AP paper: **25 MCQs** (15 math + 10 GK, −0.25 per wrong answer) and a **written part of 50 marks** (4 math problems × 5 + English Language Proficiency 30). Do each test in one sitting with a clock, keep the answers covered, then mark yourself strictly.

> **How to sit a model test**
>
> MCQ: 15 minutes for all 25 (math ≈ 45 s each, GK ≈ 20 s each). Written: 15 minutes for math, 22 minutes for English. Score MCQ as (correct − 0.25 × wrong). Write every mistake on one "mistake page" and read it on the last night.

8.1 Model Test 1

Part A — MCQ (25 marks, 15 minutes)

Mathematics (15)

1. A price is increased by 20% and then decreased by 20%. The net change is:

(a) no change
(b) 4% increase
(c) 4% decrease
(d) 2% decrease

2. The cost price of 12 pens equals the selling price of 10 pens. The profit percentage is:

(a) 16⅔%
(b) 20%
(c) 25%
(d) 10%

3. If A : B = 2 : 3 and B : C = 4 : 5, then A : B : C is:

(a) 2 : 3 : 5
(b) 8 : 12 : 15
(c) 8 : 12 : 10
(d) 6 : 9 : 10

4. The average of the first 10 natural numbers is:

(a) 5
(b) 5.5
(c) 6
(d) 10

5. Simple interest on Tk 5,000 at 8% per annum for 3 years is:

(a) Tk 1,000
(b) Tk 1,200
(c) Tk 1,260
(d) Tk 1,500

6. Compound interest on Tk 8,000 at 10% per annum for 2 years (compounded yearly) is:

(a) Tk 1,600
(b) Tk 1,640
(c) Tk 1,680
(d) Tk 1,800

7. A can finish a job in 10 days and B in 15 days. Working together they finish it in:

(a) 5 days
(b) 6 days
(c) 7.5 days
(d) 12.5 days

8. A 240 m long train running at 72 km/h crosses a 160 m long platform in:

(a) 12 s
(b) 16 s
(c) 20 s
(d) 24 s

9. If $3^{x-1} = 81$, then x =

(a) 3
(b) 4
(c) 5
(d) 6

10. If a + b = 7 and ab = 12, then $a^2 + b^2$ =

(a) 25
(b) 37
(c) 49
(d) 73

11. The number of diagonals of an octagon is:

(a) 16
(b) 20
(c) 24
(d) 28

12. Two dice are thrown. The probability that the sum is 8 is:

(a) 1/6
(b) 1/9
(c) 5/36
(d) 7/36

13. In how many ways can the letters of the word BANK be arranged?

(a) 12
(b) 16
(c) 24
(d) 4

14. Next term: 3, 7, 15, 31, ?

(a) 47
(b) 55
(c) 62
(d) 63

15. The area of a triangle with sides 6 cm, 8 cm and 10 cm is:

(a) 24 cm^2
(b) 30 cm^2
(c) 40 cm^2
(d) 48 cm^2

General Knowledge (10)

16. Bangladesh Bank was established under:

(a) Bank Company Act, 1991
(b) Bangladesh Bank Order, 1972
(c) Financial Institutions Act, 1993
(d) Money Laundering Prevention Act, 2012

17. The headquarters of SWIFT is in:

(a) Switzerland
(b) USA
(c) Belgium
(d) United Kingdom

18. UNESCO declared 21 February as International Mother Language Day in:

(a) 1952
(b) 1972
(c) 1999
(d) 2000

19. The "World Development Report" is published by:

(a) IMF
(b) World Bank
(c) UNDP
(d) WTO

20. The largest mangrove forest in the world is:

(a) Amazon
(b) Sundarbans
(c) Black Forest
(d) Congo

21. The headquarters of the United Nations is in:

(a) Geneva
(b) Paris
(c) New York
(d) Washington, D.C.

22. During the Liberation War, Bangladesh was divided into how many sectors?

(a) 7
(b) 9
(c) 11
(d) 12

23. The headquarters of the World Trade Organization (WTO) is in:

(a) Geneva
(b) Vienna
(c) Brussels
(d) Rome

24. BFIU (Bangladesh Financial Intelligence Unit) works under:

(a) Ministry of Home Affairs
(b) Anti-Corruption Commission
(c) Bangladesh Bank
(d) National Board of Revenue

25. The Language Movement martyrs gave their lives on 21 February of:

(a) 1948
(b) 1952
(c) 1954
(d) 1956

Part B — Written (50 marks, 37 minutes)

Mathematics (4 × 5 = 20)

1. A trader bought 80 kg of rice at Tk 60 per kg and 120 kg at Tk 70 per kg. He mixed them and sold the mixture at Tk 78 per kg. Find his profit percentage.
2. A and B together can finish a job in 12 days, B and C in 15 days, and C and A in 20 days. In how many days can A alone finish it?
3. The sum of the digits of a two-digit number is 9. If 27 is subtracted from the number, the digits are reversed. Find the number.
4. The difference between the compound interest (compounded yearly) and the simple interest on a sum for 3 years at 10% per annum is Tk 93. Find the sum.

English Language Proficiency (30)

1. **Correct the following sentences (10 × 1 = 10):**
   a. He is one of the best programmer in the team.
   b. Neither the manager nor his assistants was present.
   c. I have seen him yesterday.
   d. The police has arrested the thief.

e. The furnitures of the office are new.
f. Unless you do not work hard, you will fail.
g. He avoided to answer the question.
h. If he would have come, I would have met him.
i. Each of the employees have received a bonus.
j. He returned back home late.

2. **Write a paragraph (150–200 words) on "Traffic Congestion in Dhaka". (10)**
3. **Make sentences with the following words without changing their parts of speech (5 × 2 = 10):** Meticulous (adjective), Exacerbate (verb), Discrepancy (noun), Feasible (adjective), Reconcile (verb).

Answers and solutions — Model Test 1

MCQ answers

#	Ans	Working / reason	#	Ans	Working / reason
1	(c)	1.2 × 0.8 = 0.96 ⇒ 4% decrease	14	(d)	×2 + 1: 31 × 2 + 1 = 63
2	(b)	Let 1 pen cost Tk 1: CP of 10 = 10, SP of 10 = 12 ⇒ 2/10 = 20%	15	(a)	$6^2 + 8^2 = 10^2$ ⇒ right angle; ½ × 6 × 8 = 24
3	(b)	Make B equal: 2:3 = 8:12, 4:5 = 12:15 ⇒ 8 : 12 : 15	16	(b)	Bangladesh Bank Order, 1972 (President's Order No. 127)
4	(b)	(1 + 10)/2 = 5.5	17	(c)	SWIFT is headquartered in La Hulpe, Belgium
5	(b)	5000 × 8 × 3 / 100 = 1,200	18	(c)	17 November 1999 (UNESCO General Conference)
6	(c)	8000 × (1.21 − 1) = 1,680	19	(b)	World Bank; the IMF publishes the World Economic Outlook
7	(b)	10 × 15 / (10 + 15) = 150/25 = 6	20	(b)	Sundarbans (Bangladesh and India)
8	(c)	72 km/h = 20 m/s; (240 + 160)/20 = 20 s	21	(c)	New York
9	(c)	$81 = 3^4$ ⇒ x − 1 = 4 ⇒ x = 5	22	(c)	11 sectors
10	(a)	$(a + b)^2 − 2ab = 49 − 24 = 25$	23	(a)	Geneva, Switzerland
11	(b)	n(n − 3)/2 = 8 × 5/2 = 20	24	(c)	BFIU is the national financial intelligence unit inside Bangladesh Bank
12	(c)	(2,6),(3,5),(4,4),(5,3),(6,2) = 5 of 36	25	(b)	21 February 1952
13	(c)	4 different letters ⇒ 4! = 24			

Written math — full-mark solutions

Math 1 — profit percentage

Cost of first lot = 80 × 60 = Tk 4,800; cost of second lot = 120 × 70 = Tk 8,400
Total cost = Tk 13,200 for 80 + 120 = 200 kg
Selling price = 200 × 78 = Tk 15,600
Profit = 15,600 − 13,200 = Tk 2,400
Profit % = 2400/13200 × 100 = 200/11 = **18 2/11 % (≈ 18.18%)**
Check: 13,200 × (1 + 2/11) = 13,200 × 13/11 = 15,600 ✔

Math 2 — work (three pairs)

Let the one-day works of A, B, C be a, b, c.
a + b = 1/12 ...(i), b + c = 1/15 ...(ii), c + a = 1/20 ...(iii)
Adding: 2(a + b + c) = 1/12 + 1/15 + 1/20 = (5 + 4 + 3)/60 = 1/5 ⇒ a + b + c = 1/10
a = (a + b + c) − (b + c) = 1/10 − 1/15 = (3 − 2)/30 = 1/30
∴ A alone finishes in **30 days**.
Check: b = 1/12 − 1/30 = 1/20, c = 1/15 − 1/20 = 1/60; c + a = 1/60 + 2/60 = 1/20 ✔

Math 3 — digits

Let the tens digit be x and the units digit be y. Number = 10x + y.
x + y = 9 ...(i)
(10x + y) − 27 = 10y + x ⇒ 9x − 9y = 27 ⇒ x − y = 3 ...(ii)
(i) + (ii): 2x = 12 ⇒ x = 6, y = 3
∴ The number is **63**. Check: 63 − 27 = 36 (digits reversed), 6 + 3 = 9 ✔

Math 4 — CI − SI for 3 years

Let the sum be P. With r = 10% = 1/10:
CI = $P[(11/10)^3 - 1] = P(1331 - 1000)/1000 = 331P/1000$
SI = P × 3 × 1/10 = 300P/1000
CI − SI = 31P/1000 = 93 ⇒ P = 93 × 1000/31 = **Tk 3,000**
Shortcut (3 years): CI − SI = $P \cdot r^2(3 + r) = P \times 0.01 \times 3.1 = 0.031P$ ✔

English — answers

#	Correct sentence	Rule
a	He is one of the best **programmers** in the team.	one of the + plural noun
b	Neither the manager nor his assistants **were** present.	neither ... nor: verb agrees with the nearer subject
c	I **saw** him yesterday.	Past time word (yesterday) ⇒ simple past, not present perfect
d	The police **have** arrested the thief.	"police" is always plural
e	The **furniture** of the office **is** new.	furniture is uncountable: no -s, singular verb
f	**Unless you work hard**, you will fail.	"unless" already means "if not" — no second negative

g	He avoided **answering** the question.	avoid + gerund
h	If he **had come**, I would have met him.	Third conditional: If + had + V3, would have + V3
i	Each of the employees **has** received a bonus.	each of + plural noun ⇒ singular verb
j	He **returned** home late.	"return back" is redundant

Model paragraph — Traffic Congestion in Dhaka (≈ 180 words)

TRAFFIC CONGESTION IN DHAKA

Traffic congestion has become one of the most serious problems of Dhaka, a city where millions of people move every day on a limited road network. A trip that should take twenty minutes often takes two hours, and office workers, students and patients waiting for ambulances all suffer. The causes are many. The number of private cars and other vehicles is growing much faster than the roads, while footpaths are occupied by hawkers and parked vehicles. Many drivers ignore traffic rules, buses stop anywhere to pick up passengers, and most offices, schools and markets are concentrated in a few central areas. The cost is huge: lost working hours, wasted fuel, air and noise pollution, and constant stress. To reduce congestion, the city needs an efficient mass transit system, strict enforcement of traffic laws, fixed bus stops, free footpaths and decentralisation of offices and educational institutions. Citizens must also follow lane discipline and use public transport more. If the government and the people work together, Dhaka can become a city that moves rather than a city that waits.

Word (part of speech)	Model sentence
Meticulous (adjective)	A meticulous auditor checks every voucher before signing the branch report.
Exacerbate (verb)	Weak passwords exacerbate the risk of cyber attacks on online banking.
Discrepancy (noun)	The officer found a discrepancy between the cash in the vault and the ledger balance.
Feasible (adjective)	Opening a sub-branch in every union is not financially feasible for the bank this year.
Reconcile (verb)	The accounts team must reconcile the ATM cash with the switch report every day.

8.2 Model Test 2

Part A — MCQ (25 marks, 15 minutes)

Mathematics (15)

1. If 30% of a number is 45, then 60% of the number is:

(a) 75 (b) 90
(c) 135 (d) 150

2. A shopkeeper marks an article 25% above cost and allows a 10% discount. His profit is:

(a) 15% (b) 12.5%
(c) 12% (d) 10%

3. Tk 1,800 is divided between two people in the ratio 4 : 5. The larger share is:

(a) Tk 800
(b) Tk 900
(c) Tk 1,000
(d) Tk 1,125

4. The average of 5 numbers is 20. When one number is removed, the average becomes 18. The removed number is:

(a) 22
(b) 26
(c) 28
(d) 30

5. At what rate of simple interest does a sum double itself in 8 years?

(a) 8%
(b) 10%
(c) 12.5%
(d) 16%

6. Pipe A fills a tank in 12 hours, pipe B in 15 hours, and pipe C empties it in 20 hours. If all three are opened together, the tank is full in:

(a) 8 hours
(b) 10 hours
(c) 12 hours
(d) 15 hours

7. Walking at 5 km/h a man reaches office 10 minutes late; at 6 km/h he reaches 5 minutes early. The distance is:

(a) 6 km
(b) 7.5 km
(c) 9 km
(d) 10 km

8. Two trains 150 m and 100 m long run in opposite directions at 50 km/h and 40 km/h. They cross each other in:

(a) 9 s
(b) 10 s
(c) 12 s
(d) 25 s

9. If $x - 1/x = 3$, then $x^2 + 1/x^2 =$

(a) 7
(b) 9
(c) 11
(d) 13

10. If $2x + 3y = 12$ and $x - y = 1$, then $y =$

(a) 1
(b) 2
(c) 3
(d) 4

11. The LCM of 12, 18 and 30 is:

(a) 90
(b) 120
(c) 180
(d) 360

12. Each interior angle of a regular pentagon is:

(a) 72°
(b) 108°
(c) 120°
(d) 135°

13. A committee of 3 is chosen from 5 men and 4 women. In how many ways can it have exactly 2 women?

(a) 20 (b) 30
(c) 40 (d) 60

14. Three coins are tossed. The probability of getting at least one head is:

(a) 1/8 (b) 3/8
(c) 1/2 (d) 7/8

15. If the radius of a circle is doubled, its area increases by:

(a) 100% (b) 200%
(c) 300% (d) 400%

General Knowledge (10)

16. The Basel Accords (Basel I, II, III) deal with:

(a) climate change (b) bank capital and risk regulation
(c) world trade tariffs (d) nuclear safety

17. The IMF and the World Bank were created at the conference of:

(a) Yalta, 1945 (b) Bretton Woods, 1944
(c) Geneva, 1947 (d) San Francisco, 1945

18. The headquarters of the Asian Development Bank (ADB) is in:

(a) Tokyo (b) Bangkok
(c) Manila (d) Singapore

19. The headquarters of the Islamic Development Bank (IsDB) is in:

(a) Riyadh (b) Jeddah
(c) Dubai (d) Kuwait City

20. The Central Shaheed Minar was designed by:

(a) Syed Mainul Hosain (b) Hamidur Rahman
(c) Zainul Abedin (d) Louis I. Kahn

21. Bangladesh became a member of the United Nations on:

(a) 16 December 1972 (b) 26 March 1973
(c) 17 September 1974 (d) 21 February 1975

22. The largest planet of the solar system is:

(a) Saturn (b) Jupiter
(c) Neptune (d) Earth

23. Kaptai Lake is in which district?

(a) Bandarban (b) Khagrachhari
(c) Rangamati (d) Sylhet

24. How many Sustainable Development Goals (SDGs) are there?

(a) 8 (b) 15
(c) 17 (d) 169

25. The World Wide Web was invented by:

(a) Vint Cerf (b) Tim Berners-Lee
(c) Bill Gates (d) Charles Babbage

Part B — Written (50 marks, 37 minutes)

Mathematics (4 × 5 = 20)

1. The population of a town grows by 10% every year. The present population is 26,620. What was the population 3 years ago?
2. A train passes a pole in 15 seconds and a 300 m long platform in 30 seconds. Find the length of the train and its speed in km/h.
3. The length of a rectangle is 2 m more than its width, and its diagonal is 10 m. Find its area and perimeter.
4. In a group of 60 people, 35 like tea, 30 like coffee and 10 like neither. (a) How many like both? (b) If one person is chosen at random, what is the probability that he/she likes tea only?

English Language Proficiency (30)

1. **Correct the following sentences (10 × 1 = 10):**
   a. The number of applicants have increased this year.
   b. He is used to work at night.
   c. Scarcely had I entered the room than the phone rang.
   d. I prefer tea than coffee.
   e. She did not came to the office yesterday.
   f. He has been working here since five years.
   g. The manager made me to wait for an hour.
   h. I am looking forward to meet you.
   i. He gave me an useful advice.
   j. It is high time we start working on the project.
2. **Focus Writing (150–200 words): "Cashless Society: Opportunities and Risks for Bangladesh". (10)**
3. **Make sentences with the following words without changing their parts of speech (5 × 2 = 10):** Pragmatic (adjective), Alleviate (verb), Integrity (noun), Inevitable (adjective), Compromise (verb).

Answers and solutions — Model Test 2

MCQ answers

#	Ans	Working / reason	#	Ans	Working / reason
1	(b)	60% is double 30% ⇒ 2 × 45 = 90	14	(d)	1 − P(no head) = 1 − 1/8 = 7/8

2	(b)	$1.25 \times 0.90 = 1.125 \Rightarrow 12.5\%$	15	(c)	Area $\propto r^2$: $2^2 = 4$ times $\Rightarrow$ increase 300%
3	(c)	$1800 \times 5/9 = 1{,}000$	16	(b)	Set by the Basel Committee on Banking Supervision (BIS, Basel)
4	(c)	$5 \times 20 - 4 \times 18 = 100 - 72 = 28$	17	(b)	Bretton Woods, USA, July 1944
5	(c)	SI = P in 8 years $\Rightarrow$ r = 100/8 = 12.5%	18	(c)	Manila (Mandaluyong, Metro Manila), Philippines
6	(b)	$1/12 + 1/15 - 1/20 = (5 + 4 - 3)/60 = 1/10 \Rightarrow 10$ h	19	(b)	Jeddah, Saudi Arabia
7	(b)	Time gap 15 min: $d/5 - d/6 = 1/4 \Rightarrow d/30 = 1/4 \Rightarrow d = 7.5$ km	20	(b)	Hamidur Rahman (with Novera Ahmed); Syed Mainul Hosain designed the National Martyrs' Memorial
8	(b)	Relative speed 90 km/h = 25 m/s; 250/25 = 10 s	21	(c)	17 September 1974 (136th member)
9	(c)	$(x - 1/x)^2 + 2 = 9 + 2 = 11$	22	(b)	Jupiter
10	(b)	$x = y + 1 \Rightarrow 2y + 2 + 3y = 12 \Rightarrow y = 2$ (x = 3)	23	(c)	Rangamati (man-made lake of the Kaptai dam on the Karnaphuli)
11	(c)	$12 = 2^2 \cdot 3$, $18 = 2 \cdot 3^2$, $30 = 2 \cdot 3 \cdot 5 \Rightarrow 2^2 \cdot 3^2 \cdot 5 = 180$	24	(c)	17 goals (169 targets), Agenda 2030
12	(b)	$(5 - 2) \times 180°/5 = 108°$	25	(b)	Tim Berners-Lee (1989, CERN)
13	(b)	${}^4C_2 \times {}^5C_1 = 6 \times 5 = 30$			

Written math — full-mark solutions

Math 1 — population 3 years ago

Let the population 3 years ago be P.

$P \times (1 + 10/100)^3 = 26{,}620 \Rightarrow P \times (11/10)^3 = 26{,}620 \Rightarrow P \times 1331/1000 = 26{,}620$

$P = 26{,}620 \times 1000/1331 = 20 \times 1000 =$ **20,000** (since $26{,}620 = 20 \times 1331$)

Check: 20,000 → 22,000 → 24,200 → 26,620 ✔

Math 2 — train, pole and platform

Let the length of the train be L m and its speed v m/s.

Passing a pole: $L = 15v$ ...(i)

Passing the platform: $L + 300 = 30v$ ...(ii)

(ii) − (i): $300 = 15v \Rightarrow v = 20$ m/s $= 20 \times 18/5 =$ **72 km/h**

From (i): $L = 15 \times 20 =$ **300 m**

Check: $(300 + 300)/20 = 30$ s ✔

Math 3 — rectangle from its diagonal

Let the width be x m; length = (x + 2) m.
By Pythagoras: $x^2 + (x + 2)^2 = 10^2 \Rightarrow 2x^2 + 4x + 4 = 100 \Rightarrow x^2 + 2x - 48 = 0$
$(x + 8)(x - 6) = 0 \Rightarrow x = 6$ (width cannot be negative)
Width = 6 m, length = 8 m
Area = 6 × 8 = **48 m²**; perimeter = 2(6 + 8) = **28 m**
Check: $6^2 + 8^2 = 36 + 64 = 100 = 10^2$ ✔

Math 4 — sets and probability

People who like at least one drink = 60 − 10 = 50
$n(T \cup C) = n(T) + n(C) - n(T \cap C) \Rightarrow 50 = 35 + 30 - n(T \cap C) \Rightarrow$ (a) $n(T \cap C) =$ **15**
Tea only = $n(T) - n(T \cap C) = 35 - 15 = 20$
(b) P(tea only) = 20/60 = **1/3**
Check: tea only 20 + coffee only 15 + both 15 + neither 10 = 60 ✔

English — answers

#	Correct sentence	Rule
a	The number of applicants **has** increased this year.	"The number of" ⇒ singular; "A number of" ⇒ plural
b	He is used to **working** at night.	be used to + gerund (= accustomed to)
c	Scarcely had I entered the room **when** the phone rang.	scarcely/hardly … when; no sooner … than
d	I prefer tea **to** coffee.	prefer A to B
e	She did not **come** to the office yesterday.	did/do/does + base verb
f	He has been working here **for** five years.	for + period; since + point of time
g	The manager made me **wait** for an hour.	make/let/have + object + bare infinitive (active voice)
h	I am looking forward to **meeting** you.	look forward to + gerund ("to" is a preposition)
i	He gave me **a useful piece of advice** / **some useful advice**.	"useful" begins with a "yoo" sound ⇒ a; advice is uncountable
j	It is high time we **started** working on the project.	it is high time + subject + past tense

Model Focus — Cashless Society: Opportunities and Risks for Bangladesh (≈ 190 words)

CASHLESS SOCIETY: OPPORTUNITIES AND RISKS FOR BANGLADESH

A cashless society is one where most payments are made through cards, mobile wallets, QR codes and online transfers instead of notes and coins. Bangladesh is moving in this direction: mobile financial services are used across the country, Bangla QR lets small shops accept digital payments, and NPSB, BEFTN and RTGS have made interbank transfers faster. The opportunities are clear. Digital payments save time and the cost of printing and handling cash, reduce the risk of theft, and leave a record that helps banks give credit to small traders. They also bring rural people, women and remittance-receiving families into the formal financial system. However, the risks cannot be ignored. Phishing calls, OTP fraud and hacking can destroy public trust, many elderly and rural people still lack digital literacy, and network coverage is uneven. Excessive dependence on a few platforms also raises concerns about data privacy and system outages. Therefore, banks and regulators should strengthen cyber security, run awareness campaigns in Bangla, keep transaction charges low and design simple apps for first-time users. If security and inclusion go hand in hand, a cashless Bangladesh can be both efficient and fair.

Word (part of speech)	Model sentence
Pragmatic (adjective)	The bank took a pragmatic approach and rescheduled the loans of flood-affected farmers.
Alleviate (verb)	Microcredit can alleviate poverty when it is combined with skills training.
Integrity (noun)	A banker's integrity is tested when no one is watching the transaction.
Inevitable (adjective)	Some delay was inevitable because the core banking system was being upgraded.
Compromise (verb)	Never compromise customer data by sharing your password with a colleague.

8.3 Last-Night Checklist (Friday, 30 October)

✓	Item
☐	**Logistics:** admit card printed (write nothing on it); black ball-point pens (2); route to Tejgaon Government High School fixed; reach by 8:30 (no entry after 9:15); no phone, watch, calculator, bag or card
☐	**Percent and profit:** successive change $a + b + ab/100$ · mark-up m and discount d ⇒ $(1 + m)(1 − d) \cdot SP = CP(1 \pm p\%)$
☐	**Interest:** $SI = Pnr$ · $CI = P[(1 + r)^n − 1]$ · CI − SI for 2 years = Pr^2, for 3 years = $Pr^2(3 + r)$
☐	**Work and speed:** together = $ab/(a + b)$ · km/h × 5/18 = m/s · train crossing = $(L_1 + L_2)$/relative speed · boat: still = (down + up)/2, stream = (down − up)/2
☐	**Algebra and counting:** $x^2 + 1/x^2 = (x \pm 1/x)^2 \mp 2$ · $a^2 + b^2 = (a + b)^2 − 2ab$ · ${}^nC_2$ handshakes · diagonals $n(n − 3)/2$ · interior angle sum $(n − 2) \times 180°$ · P(at least one) = 1 − P(none)

☐	**Grammar 10:** nearer-subject rule (neither/nor, either/or) · as well as / along with ⇒ first subject · one of the + plural · one of the … who + plural verb · conditionals (had + V3 → would have + V3) · hardly/scarcely … when, no sooner … than · insist/suggest that + base verb · it is high time + past · look forward to / used to + -ing · a/an by sound (a unanimous, an hour)
☐	**Writing:** paragraph = one block, title in capitals, 150–200 words · Focus = intro → Bangladesh scene → benefits → challenges → way forward → conclusion · sentence making = keep the part of speech
☐	**GK:** read the Chapter 7 tables once; 10 minutes on the newspaper's economy page for names that change (verify latest)
☐	**Bangla** (if your post has it): compounds, sandhi, one-word substitution from Chapter 6
☐	Read your mistake page from the two model tests — then sleep by 11 PM

In the hall

MCQ: answer only when you can eliminate at least one option. Written math: Let → equation → solve → box → check. English: grammar first (fast marks), then sentence making, then the paragraph. Never leave a written item blank — a correct first step still earns marks.

8.4 Actual Paper — AP 31.10.2026 (Job ID-25106), Non-Technical Written Part, Solved

This is the non-technical written part of the exam these notes were built for. Its pattern matched the model tests above: four 5-mark math problems and English Language Proficiency 30 (10 short grammar items + a 20-mark essay). Solve it once under time (≈ 30 minutes) before reading the solutions. The technical part of the same paper is solved in the AP notes, Section 2.4.

Mathematics (written, 4 × 5 = 20)

Question 16 BSCS AP 31.10.2026

Pipe A can fill a tank in 10 hours and pipe B in 15 hours. Pipe C can empty the full tank in 12 hours. If all three are opened together, how long will it take to fill the tank? (5)

Solution

In 1 hour: A fills 1/10, B fills 1/15, C empties 1/12 of the tank.
Net part filled in 1 hour = 1/10 + 1/15 − 1/12 = (6 + 4 − 5)/60 = 5/60 = 1/12.
∴ Time to fill the tank = **12 hours**.
LCM method: tank = LCM(10, 15, 12) = 60 units; A = +6, B = +4, C = −5 units/hour ⇒ net 5 units/hour ⇒ 60 ÷ 5 = 12 hours.

Question 17 BSCS AP 31.10.2026

The product of two consecutive positive odd numbers is 143. Find the numbers. (5)

Solution

Let the numbers be x and x + 2.

$x(x + 2) = 143 \Rightarrow x^2 + 2x - 143 = 0 \Rightarrow x^2 + 13x - 11x - 143 = 0 \Rightarrow (x + 13)(x - 11) = 0$

x = 11 or x = −13; the numbers are positive, so x = 11.

∴ The numbers are **11 and 13**. Check: 11 × 13 = 143 ✓

Question 18 BSCS AP 31.10.2026

In a class, if 4 students sit on each bench, then 3 benches remain empty. But if 3 students sit on each bench, then 6 students have to stand. What is the total number of students in the class? (5)

Solution

Let the number of benches be x.

4 per bench with 3 benches empty ⇒ students = 4(x − 3).

3 per bench with 6 standing ⇒ students = 3x + 6.

4(x − 3) = 3x + 6 ⇒ 4x − 12 = 3x + 6 ⇒ x = 18 benches.

Students = 3 × 18 + 6 = **60**. Check: 4 × (18 − 3) = 60 ✓

Question 19 BSCS AP 31.10.2026

The amounts of money held by A, B and C satisfy A:B = 3:4 and B:C = 5:6. If A gives Tk 5,000 to B, the ratio of their amounts becomes 1:2. Find the total amount of money originally held by all three. (5)

Solution

Make B equal in both ratios (LCM of 4 and 5 = 20): A:B = 3:4 = 15:20; B:C = 5:6 = 20:24 ⇒ **A:B:C = 15:20:24**.

Let A = 15k, B = 20k, C = 24k.

After A gives Tk 5,000 to B: (15k − 5,000) : (20k + 5,000) = 1 : 2

⇒ 2(15k − 5,000) = 20k + 5,000 ⇒ 30k − 10,000 = 20k + 5,000 ⇒ 10k = 15,000 ⇒ k = 1,500.

A = 22,500, B = 30,000, C = 36,000.

Total = 59k = 59 × 1,500 = **Tk 88,500**. Check: 17,500 : 35,000 = 1 : 2 ✓

English Language Proficiency (30)

Question 20 BSCS AP 31.10.2026

Write only the correct answers. (10)

#	Question	Answer	Why
a	By the time we arrived, the film ___ (started / had started / has started)	**had started**	The earlier of two past actions takes the past perfect; "by the time + past" is the signal
b	She is good ___ solving problems.	**at**	Fixed preposition: good at, bad at

c	Neither the teacher nor the students was present.	Neither the teacher nor the students **were** present.	Neither...nor: the verb agrees with the nearer subject (students — plural)
d	Noun form of "decide"	**decision**	decide (v) → decision (n) → decisive (adj)
e	I wish I ___ taller. (am / were / will be)	**were**	Unreal present wish ⇒ past subjunctive "were" for every person
f	Hardly ___ the station when the train left.	**had I reached**	Negative adverb first ⇒ inversion: Hardly + had + subject + V3 ... when + past
g	Passive: Someone has stolen my bicycle.	**My bicycle has been stolen.**	Present perfect passive = has been + V3; the vague agent "by someone" is dropped
h	Indirect: She said to me, "Will you help me tomorrow?"	**She asked me if I would help her the next day.**	Yes/no question ⇒ asked + if/whether; will → would; you → I, me → her; tomorrow → the next day
i	Closest in meaning to "meticulous"	**extremely careful**	meticulous = showing great attention to detail
j	Combine with "despite": It was raining heavily. They continued the match.	**Despite the heavy rain, they continued the match.**	despite + noun / gerund (never "despite of" or "despite it was")

Question 21 BSCS AP 31.10.2026

Write an essay on: Job prospects in the age of Artificial Intelligence. (20)

Plan (2 minutes) — what earns 20 marks

Title · introduction with a clear thesis · 3–4 body paragraphs, each with one idea (jobs at risk, jobs created, Bangladesh's situation, skills and policy) · conclusion · about 400–450 words · simple, correct sentences · linking words (however, moreover, therefore, as a result).

Model essay

Job Prospects in the Age of Artificial Intelligence

Introduction. Artificial Intelligence (AI) is no longer a subject of science fiction. Machines can now write reports, answer customers, detect fraud and even generate computer code. This rapid progress has raised a serious question in every household: will AI take away our jobs? The answer is not a simple yes or no. AI will certainly replace some tasks, but it will also create new jobs and change almost every existing one. Our job prospects will depend on how quickly we adapt.

Jobs at risk. AI is most effective at routine and repetitive work. Data entry, basic accounting, call-centre support, simple translation and document checking can now be done faster and cheaper by software. In banks, chatbots already answer balance enquiries, and automated systems verify cheques and KYC documents. Workers whose jobs consist mainly of such tasks face the greatest risk of losing them or of seeing their wages fall.

New opportunities. At the same time, AI is opening doors that did not exist a decade ago. Data scientists, machine-learning engineers, AI trainers, cybersecurity specialists and cloud engineers are in high demand. Even non-technical roles are growing, such as AI product managers, digital marketers and compliance officers who make sure AI is used fairly. According to the World Economic Forum's Future of Jobs Report 2025, technology is expected to create about 170 million jobs and displace about 92 million by 2030 — a net gain, but only for those with the right skills.

The Bangladesh context. For Bangladesh, AI is both a threat and an opportunity. Automation may reduce low-skill jobs in the garment sector and in back-office services. However, the country has a young population and one of the largest freelancing workforces in the world. If our youth learn to use AI tools, they can offer software, design and data services to global clients. Programmes for digital skills, together with the growth of fintech and e-commerce, can turn AI into an engine of employment rather than unemployment.

The way forward. To benefit from AI, we must change how we learn and work. Education should focus on problem-solving, programming, data literacy, communication and creativity — skills that machines cannot easily copy. Workers need lifelong learning through reskilling and upskilling. The government and employers should invest in training, protect workers during the transition, and set rules for the ethical use of AI.

Conclusion. AI will not simply destroy jobs; it will redesign them. People will not be replaced by AI so much as by people who know how to use AI. If we prepare our workforce with the right skills and policies, the age of Artificial Intelligence can become an age of better, safer and more productive jobs for all.

8.5 Actual Paper — Screening MCQ Test 2026, Set-3, Non-Technical Part, Solved

A 100-question screening MCQ paper (বাছাই পরীক্ষা ২০২৬, Set-3; the header appears to read *পায়রাবন্দর*, Payra Port — employer unconfirmed): 1 hour, +1 per correct answer, **−0.50 per wrong answer**. 60 of the 100 questions are non-technical — English 20, Bangla 20, GK 19 and one set-theory math question — and are grouped by topic below: a short background for each topic, then its questions under their

original numbers. The 40 IT and electrical questions, and the full paper in order, are in the AP notes, Section 2.5.

> **With −0.5 per wrong answer**
>
> A blind guess among four options has expected value 0.25 − 0.75 × 0.5 = **−0.125**; after eliminating two options it is +0.25. Guess only when the expected value is positive.

1. English: prepositions and phrasal verbs Q 10, 29, 35, 40, 64

> **Background**
>
> Fixed pairs to memorise: **dream of**, **good at**, **call at** (a place) / **call on** (a person) / **call up** (phone), **stand by** (support), **turn down** (refuse), insist on, depend on, interested in, afraid of, capable of.

10. Faria dreams ___ running her own business.

(a) to
(b) of
(c) by
(d) in

Answer: (b) — dream of/about + gerund.

29. Richard called ___ the bank to deposit a cheque.

(a) in
(b) on
(c) at
(d) up

Answer: (c) — call at = visit a place; call on = visit a person; call up = phone.

35. He is good ___ chess.

(a) in
(b) at
(c) on
(d) with

Answer: (b) — good at + skill.

40. My parents always stand ___ my decision.

(a) with
(b) at
(c) along
(d) by

Answer: (d) — stand by = support.

64. The proposal was too good to ___.

(a) away
(b) down
(c) in
(d) off

⚠ Answer: (b) — The verb is missing in print; the intended phrase is 'too good to turn down' (= refuse).

2. English: verb patterns and special structures Q 16, 32, 67, 79, 80, 97

Background

Structure	Rule	Example
mind / look forward to / object to	+ gerund (V-ing)	Would you mind checking...; I look forward to hearing...
prefer A to B	gerund + to + gerund	She prefers dancing to singing.
No sooner ... than	No sooner had + S + V3 ... than + past	No sooner had I run it than it failed.
as if / as though (earlier unreal)	+ past perfect	He looked as if he had rolled in mud.
It is (high) time	+ S + past simple	It is high time he changed.

16. Will you mind ___ the accounts one more time?

(a) check
(b) checked
(c) to check
(d) checking

Answer: (d) — mind + gerund.

32. Identify the correct sentence:

(a) She prefers dancing to singing.
(b) She prefers dancing than singing.
(c) She prefers to dance than singing.
(d) She prefers dancing over to sing.

Answer: (a) — prefer + gerund + to + gerund.

67. No sooner had I run the program than the system ___.

(a) had failed
(b) fail
(c) would fail
(d) failed

Answer: (d) — No sooner + had + V3 ... than + past simple.

79. I look forward to ___ from you.

(a) hearing
(b) heard
(c) hear
(d) have heard

Answer: (a) — 'to' here is a preposition → gerund.

80. The boy was so dirty that he looked as if he ___ in the mud.

(a) rolled
(b) has rolled
(c) had rolled
(d) is rolling

Answer: (c) — as if + past perfect for an earlier unreal action.

97. It is high time he (change) his behaviour.

(a) change
(b) has changed
(c) changed
(d) did change

Answer: (c) — It is high time + subject + past simple.

3. English: parts of speech and word forms Q 19, 55, 66

Background

A word that describes a noun, or follows a linking verb (be, seem, look) to describe the subject, is an **adjective** (hereditary, disagreeable). Common adjective suffixes: -ous, -ful, -able/-ible, -ive, -al, -ed (various, variable, varied). Not every suffix fits every root — 'variful' does not exist.

19. Depression is often hereditary. Here, the underlined word (hereditary) is a/an ___.

(a) noun
(b) adverb
(c) adjective
(d) verb

Answer: (c) — It describes the noun 'depression' after the linking verb 'is'.

55. Karim is a rather disagreeable man. Here, the underlined word (disagreeable) is a/an ___.

(a) noun
(b) verb
(c) adjective
(d) adverb

Answer: (c) — It qualifies the noun 'man'.

66. Which one is not an acceptable adjective form of the word "vary"?

(a) various
(b) variful
(c) variable
(d) varied

Answer: (b) — 'Variful' is not an English word.

4. English: vocabulary, idioms, spelling, literature Q 9, 27, 30, 36, 51, 53

Background

Occupation words: curator (museum), pallbearer (coffin), janitor (cleaning), archivist (records). Idioms: through thick and thin (in all circumstances), once in a blue moon (rarely), at sixes and sevens (in disorder). Spelling traps: diarrhoea, accommodation, committee, separate, occurrence. Romantic poets: Keats (To Autumn, Ode to a Nightingale), Wordsworth (Daffodils), Shelley (Ode to the West Wind).

9. The synonym of "commemorate" is ___.

(a) observe
(b) memorise
(c) forget
(d) overlook

Answer: (a) — Commemorate = honour the memory of / observe (a day). Memorise means learn by heart.

27. "Through thick and thin" means:

(a) by chance
(b) very quickly
(c) in all circumstances
(d) abruptly

Answer: (c) — In good times and bad — under all circumstances.

30. "To Autumn" is written by ___.

(a) William Shakespeare
(b) William Wordsworth
(c) John Keats
(d) Robert Frost

Answer: (c) — John Keats, ode of 1819.

36. Which one of the following is correctly spelt?

(a) Dirohea
(b) Diarrhoea
(c) Dirrohea
(d) Dirrhoea

Answer: (b) — Diarrhoea (British) / diarrhea (American).

51. A person in charge of a museum is a/an ___.

(a) Librarian
(b) architect
(c) curator
(d) janitor

Answer: (c) — Curator.

53. The people who carry a coffin at a funeral are called ___.

(a) mourners
(b) pallbearers
(c) grave diggers
(d) processioners

Answer: (b) — Pallbearers.

5. Bangla literature Q 1, 12, 37, 41, 42, 46, 63, 65, 72, 88, 92

Background

Periods: ancient (Charyapada, found 1907 by Haraprasad Shastri) → medieval (Srikrishnakirtan by Baru Chandidas, found 1909; Abdul Hakim's 'বঙ্গবাণী'; last poet Bharatchandra, d. 1760) → modern (from 1800, Fort William College starts Bangla prose; Vidyasagar's বর্ণপরিচয় 1855). **Must-know authors:** Rokeya (অবরোধবাসিনী, মতিচূর), Sarat Chandra (পথের দাবী — banned), Bibhutibhushan (পথের পাঁচালী → আম আঁটির ভেঁপু), Pramatha Chowdhury (pen name বীরবল), Rabindranath (ডাকঘর — drama). **Liberation War novels:** রাইফেল রোটি আওরাত (Anwar Pasha), জোছনা ও জননীর গল্প (Humayun Ahmed), হাঙর নদী গ্রেনেড (Selina Hossain).

1. কোনটি বেগম রোকেয়া সাখাওয়াত হোসেনের রচনা?

(a) নারী
(b) অবরোধবাসিনী
(c) সংস্কৃতি-কথা
(d) সাঁঝের মায়া

Answer: (b) — Abarodhbasini (1931) — also Motichur, Padmarag, Sultana's Dream. Sanjher Maya is by Sufia Kamal; Sanskriti-Katha by Motaher Hossain Chowdhury.

12. বাংলা গদ্যের বিকাশে কোন প্রতিষ্ঠানটির ভূমিকা রয়েছে?

(a) হিন্দু কলেজ
(b) সংস্কৃত কলেজ
(c) ফোর্ট উইলিয়াম কলেজ
(d) কলিকাতা কলেজ

Answer: (c) — Fort William College (1800), where William Carey's pundits wrote the first Bangla prose textbooks.

37. 'বঙ্গবাণী' কবিতার রচয়িতা—

(a) আবদুল হাকিম
(b) মাইকেল মধুসূদন দত্ত
(c) কাজী নজরুল ইসলাম
(d) জীবনানন্দ দাশ

Answer: (a) — Abdul Hakim (17th c.): 'যে সবে বঙ্গেত জন্মি হিংসে বঙ্গবাণী...'.

41. 'বর্ণপরিচয়'-এর রচয়িতা কে?

(a) বঙ্কিমচন্দ্র চট্টোপাধ্যায়
(b) রামমোহন রায়
(c) ঈশ্বরচন্দ্র বিদ্যাসাগর
(d) উইলিয়াম কেরী

Answer: (c) — Ishwar Chandra Vidyasagar (1855).

42. 'শ্রীকৃষ্ণকীর্তন' আবিষ্কৃত হয় কত সালে?

(a) ১৯০২ সালে
(b) ১৯০৭ সালে
(c) ১৯০৯ সালে
(d) ১৯১১ সালে

Answer: (c) — Found by Basanta Ranjan Roy in 1909 (Bankura); published 1916. (Charyapada: 1907.)

46. 'আম আঁটির ভেঁপু' রচনাটি কোন উপন্যাসের সঙ্গে সম্পর্কিত?

(a) কপালকুণ্ডলা
(b) পথের পাঁচালী
(c) পুতুলনাচের ইতিকথা
(d) কবি

Answer: (b) — Abridged children's edition of Bibhutibhushan's Pather Panchali.

63. শরৎচন্দ্র চট্টোপাধ্যায়ের কোন উপন্যাস ব্রিটিশ সরকার কর্তৃক বাজেয়াপ্ত হয়েছিল?

(a) দেবদাস
(b) পথের দাবী
(c) চরিত্রহীন
(d) গৃহদাহ

Answer: (b) — Pather Dabi (1926), banned for its revolutionary theme.

65. মধ্যযুগের শেষ কবির নাম কী?

(a) ভারতচন্দ্র রায় গুণাকর
(b) শাহ মুহম্মদ সগীর
(c) চণ্ডীদাস
(d) ঈশ্বরচন্দ্র গুপ্ত

Answer: (a) — Bharatchandra (d. 1760). Ishwar Gupta is the 'poet of the transition age' (যুগসন্ধিক্ষণের কবি).

72. 'বীরবল' কার ছদ্মনাম?

(a) বিহারীলাল চক্রবর্তী
(b) রবীন্দ্রনাথ ঠাকুর
(c) সৈয়দ মুজতবা আলী
(d) প্রমথ চৌধুরী

Answer: (d) — Pramatha Chowdhury (editor of Sabuj Patra).

88. মুক্তিযুদ্ধভিত্তিক উপন্যাস কোনটি?

(a) আরেক ফাল্গুন
(b) রাইফেল রোটি আওরাত
(c) খোয়াবনামা
(d) ক্রীতদাসের হাসি

Answer: (b) — Anwar Pasha (1973). Arek Falgun = Language Movement; Khoabnama = Tebhaga/Pakistan era; Kritadasher Hasi = allegory of Ayub rule.

92. 'ডাকঘর' কোন ধরনের রচনা?

(a) গল্প
(b) উপন্যাস
(c) নাটক
(d) প্রবন্ধ

Answer: (c) — Drama (1912).

6. Bangla grammar Q 5, 25, 31, 49, 62, 70, 90, 96, 100

Background

Branches: ধ্বনিতত্ত্ব (phonology), রূপতত্ত্ব (morphology), বাক্যতত্ত্ব (syntax), অর্থতত্ত্ব (semantics). Basic vowel sounds (মৌলিক স্বরধ্বনি) = 7: অ আ ই উ এ ও অ্যা. **Pronunciation:** ক্ষ = ক্‌খ, and initial অ before a conjunct often sounds ও (দক্ষ → দোক্‌খো). **উপমান কর্মধারয়:** standard + common quality (ভ্রমরের ন্যায় কালো = ভ্রমরকালো); উপমিত: compared object + standard (মুখ চন্দ্রের ন্যায় = মুখচন্দ্র). **Spelling:** দুরবস্থা, উপর্যুক্ত, শুধু/মাত্র (not both). **One-word:** যা নিবারণ করা যায় না — অনিবার্য; কষ্টে নিবারণ করা যায় — দুর্নিবার. Idioms: আমড়া কাঠের ঢেঁকি — অপদার্থ.

5. কোনটি শুদ্ধ?

(a) উপরোক্ত
(b) দুরবস্থা
(c) দুরাবস্থা
(d) শুধুমাত্র

Answer: (b) — দুরবস্থা (দুঃ + অবস্থা) is correct. Correct forms of the others: উপর্যুক্ত, দুরবস্থা, শুধু / মাত্র.

25. 'নদীর পাড়ের গাছ' প্রবাদটির অর্থ কী?

(a) বিপজ্জনক
(b) ক্ষুদ্র
(c) অনিশ্চিত অস্তিত্ব
(d) ক্ষণস্থায়ী

⚠ Answer: (c) — A tree on an eroding river bank may fall at any time — its existence is uncertain.

31. 'আমড়া কাঠের ঢেঁকি' বাগধারাটির অর্থ কী?

(a) তস্কর
(b) অপদার্থ
(c) দুর্লভ বস্তু
(d) গলা ধাক্কা

Answer: (b) — Worthless / good-for-nothing (অপদার্থ).

49. 'দক্ষ'-এর সঠিক উচ্চারণ —

(a) দোক্‌খো
(b) দোক্‌খ
(c) দক্‌খো
(d) দক্‌কো

Answer: (a) — ক্ষ is pronounced ক্‌খ and the first অ becomes ও: দোক্‌খো.

62. 'Phonology' শব্দের অর্থ কী?

(a) ধ্বনিতত্ত্ব
(b) রূপতত্ত্ব
(c) বাক্যতত্ত্ব
(d) অর্থতত্ত্ব

Answer: (a) — Phonology = ধ্বনিতত্ত্ব; morphology = রূপতত্ত্ব; syntax = বাক্যতত্ত্ব; semantics = অর্থতত্ত্ব.

70. 'ভ্রমর কালো' কোন সমাস?

(a) উপমান কর্মধারয়
(b) সাধারণ কর্মধারয়
(c) উপমিত কর্মধারয়
(d) মধ্যপদলোপী কর্মধারয়

Answer: (a) — ভ্রমরের ন্যায় কালো — the standard of comparison (ভ্রমর) + common quality (কালো) = upaman karmadharay.

90. বাংলা ভাষায় মৌলিক স্বরধ্বনি কয়টি?

(a) ১১ টি
(b) ৯ টি
(c) ৭ টি
(d) ৫ টি

Answer: (c) — অ, আ, ই, উ, এ, ও, অ্যা — 7. (Vowel letters: 11.)

96. 'মতি' শব্দের সমার্থক শব্দ-

(a) মনন
(b) বৃদ্ধি
(c) রুচি
(d) অলংকার

Answer: (c) — মতি = মন, বুদ্ধি, রুচি, প্রবৃত্তি. Note (b) is বৃদ্ধি (growth), not বুদ্ধি.

100. 'যা নিবারণ করা যায় না' -এক কথায় কী বলে?

(a) দুর্নিবার
(b) অনিবার্য
(c) দুর্লভ
(d) দুর্দমনীয়

Answer: (b) — অনিবার্য. দুর্নিবার = that is hard to prevent; দুর্দমনীয় = hard to suppress.

7. GK: Bangladesh Q 2, 7, 8, 11

Background

Seaports: Chattogram (largest, 1888), Mongla (2nd, 1950), Payra (3rd, 2013); Matarbari deep-sea port under construction. **Gas fields:** Titas largest by reserve, Bibiyana largest producer; first found: Haripur (1955). **Elections:** first parliamentary election 7 March 1973. **Rivers:** Padma, Meghna, Jamuna are the main systems; guidebooks usually list Padma as flowing through the most districts.

2. Which is the second largest seaport of Bangladesh?

(a) Payra Port
(b) Mongla Port
(c) Chattogram Port
(d) Matarbari Port

Answer: (b) — Chattogram is the largest, Mongla second, Payra third.

7. By reserves, which is the largest gas field of Bangladesh?

(a) Sangu
(b) Kailashtila
(c) Meghna
(d) Titas

Answer: (d) — Titas (Brahmanbaria) is the largest by reserve; Bibiyana is the largest by current production (not an option).

8. Which river of Bangladesh flows through the most districts?

(a) Padma
(b) Jamuna
(c) Meghna
(d) Mahananda

⚠ Answer: (a) — Padma — the answer given in most job-exam guides (sources differ; some say Meghna).

11. In which year was the first parliamentary election of Bangladesh held after independence?

(a) 1971
(b) 1972
(c) 1973
(d) 1974

Answer: (c) — 7 March 1973.

8. GK: international affairs

Q 6, 17, 21, 23, 33, 38, 43, 54, 57, 61, 71, 74, 84, 85, 87

Background

UN: Charter signed 26 June 1945, in force 24 October 1945 (UN Day); HQ New York — also UNICEF, UNDP; Geneva hosts WHO, ILO, UNHCR; Paris UNESCO; Rome FAO. Smallest member by area: Monaco; Vatican City is an observer. **Treaties:** Kyoto Protocol (1997, greenhouse gases), Paris Agreement (2015), CEDAW (1979, women's rights); COP-31 in 2026 is hosted by Türkiye. **Others:** Brazil largest in South America; Amazon = lungs of the earth; Mars = red planet; Churchill = WWII PM; Chancellor heads the government in Germany/Austria; persona non grata = unwelcome diplomat; BIMSTEC chair: Bangladesh (from April 2025); FIFA World Cup 2030 Morocco–Spain–Portugal, 2034 Saudi Arabia.

6. Which is the largest country of South America by area?

(a) Argentina
(b) Brazil
(c) Peru
(d) Colombia

Answer: (b) — Brazil (≈8.5 million km^2, about half of the continent).

17. The Kyoto Protocol is about ___.

(a) climate change
(b) nuclear non-proliferation
(c) preventing desertification
(d) sharing water of international rivers

Answer: (a) — 1997 treaty to cut greenhouse-gas emissions (UNFCCC).

21. Where is the headquarters of UNICEF?

(a) New York
(b) London
(c) Geneva
(d) Paris

Answer: (a) — New York, USA.

23. Where is the headquarters of the UN agency UNDP?

(a) Toronto, Canada
(b) Amsterdam, Netherlands
(c) London, UK
(d) New York, USA

Answer: (d) — New York, USA.

33. Where will COP-31 be held?

(a) Türkiye
(b) Mexico
(c) Sydney
(d) Berlin

Answer: (a) — COP-31 (November 2026) is hosted in Antalya, Türkiye, with Australia leading the negotiations.

38. Which country will host the 2034 FIFA World Cup?

(a) Russia
(b) Saudi Arabia
(c) Morocco
(d) Spain

Answer: (b) — Saudi Arabia (confirmed Dec 2024). 2030: Morocco–Spain–Portugal.

43. By area, which is the smallest member state of the UN among these?

(a) Tuvalu
(b) Haiti
(c) Vatican City
(d) Nauru

Answer: (d) — Vatican City is only an observer, not a member. Nauru (21 km^2) < Tuvalu (26 km^2). (Monaco, 2 km^2, is the true smallest member.)

54. Who was the Prime Minister of the UK during the Second World War?

(a) Winston Churchill
(b) Harold Macmillan
(c) Anthony Eden
(d) Margaret Thatcher

Answer: (a) — Churchill (1940–45). Neville Chamberlain was PM at the start (1939–40) but is not an option.

57. Which planet is called the red planet?

(a) Mars
(b) Mercury
(c) Jupiter
(d) Venus

Answer: (a) — Mars (iron oxide on its surface).

61. The CEDAW convention speaks of whose rights?

(a) children
(b) refugees
(c) migrants
(d) women

Answer: (d) — Convention on the Elimination of All Forms of Discrimination Against Women (1979).

71. From which date did the UN Charter come into force?

(a) 26 June 1945
(b) 24 October 1945
(c) 10 December 1945
(d) 10 January 1946

Answer: (b) — Signed 26 June 1945; in force 24 October 1945 (UN Day).

74. Which of these is called the lungs of the earth?

(a) Sundarbans
(b) Amazon rainforest
(c) Boreal forest
(d) Congo rainforest

Answer: (b) — Amazon rainforest.

84. What does 'Persona non grata' mean?

(a) honoured person
(b) ambassador-level person
(c) unacceptable person
(d) minister-level person

Answer: (c) — A diplomat declared unwelcome by the host country.

85. Which country currently holds the BIMSTEC chairmanship?

(a) Thailand
(b) India
(c) Nepal
(d) Bangladesh

Answer: (d) — Bangladesh took over from Thailand at the 6th summit (Bangkok, April 2025).

87. The Chancellor is the head of government of which country?

(a) Canada
(b) France
(c) Poland
(d) Germany

Answer: (d) — Germany (also Austria).

9. Math: sets Q 39

Background

Inclusion–exclusion: $|A \cup B| = |A| + |B| - |A \cap B|$; for three sets add back $|A \cap B \cap C|$: $|A \cup B \cup C| = \Sigma A - \Sigma(\text{pairs}) + |A \cap B \cap C|$. Example: 40 like tea, 30 coffee, 10 both → 60 like at least one.

39. Which one is the principle of inclusion/exclusion of two sets intersecting each other?

(a) $|A \cup B| = |A| + |B| - |A \cap B|$
(b) $|A \cup B| = |A| + |B|$
(c) $|A \cap B| = |A| + |B|$
(d) $|A \cap B| = |A| - |B| + |A \cup B|$

Answer: (a) — Elements of $A \cap B$ are counted twice in $|A| + |B|$, so subtract once.