SNAP 2022 Question Paper with Solutions

Time Allowed :2 Hours	**Maximum Marks :**	**Total questions :**60

General Instructions

SNAP 2022: General Instructions

1. SNAP 2022 is a **Computer-Based Test (CBT)** of **60 minutes**.
2. The test comprises **60 multiple-choice questions** across three sections: General English (15), Analytical & Logical Reasoning (25), and Quantitative, Data Interpretation & Data Sufficiency (20).
3. **Marking Scheme:** +1 mark for each correct answer; **–0.25 mark** for each incorrect answer.
4. There is **no sectional time limit**. Manage your time wisely.
5. Carry a **colour printout** of your **SNAP 2022 Admit Card** with a recent passport-size colour photo pasted in the space provided.
6. Bring a valid, **original government photo ID** (e.g., Aadhaar, Passport, PAN, Driving Licence).
7. You may carry a **simple black/blue ball point pen** (for attendance/rough work as instructed).
8. **Reporting time** and test session are as mentioned on your admit card; late entry may not be permitted.
9. Only the Admit Card, valid Photo ID and a simple ball pen are allowed at your workstation. **Electronic gadgets** (mobile phones, smart watches, calculators, digital devices, etc.) are **strictly prohibited**.

General English

Q1. Directions: In the question below, each passage consists of six sentences. The first and sixth sentences are given in the beginning. The middle four sentences in each have been removed and jumbled up. These are labeled as P, Q, R, and S. Find out the proper order for the four sentences.

S1: In the middle of one side of the square sits the Chairman of the committee, the most important person in the room.

P: For a committee is not just a mere collection of individuals.

Q: On him rests much of the responsibility for the success or failure of the committee.

R: While this is happening we have an opportunity to get the 'feel' of this committee.

S: As the meeting opens, he runs briskly through a number of formalities.

S6: From the moment its members meet, it begins to have a sort of nebulous life of its own.

1) RSQP

2) PQRS

3) SQPR

4) QSRP

Correct Answer: (4) QSRP

Solution:

Step 1: Anchor with the subject introduced in S1.

S1 highlights *the Chairman*. Among P, Q, R, S, only **Q** ("*On him rests much of the responsibility...*") directly continues the focus on the Chairman using the pronoun *him*.

$\Rightarrow$ Most natural start after S1 is **Q**.

Step 2: Follow the Chairman's immediate action at meeting start.

After establishing his responsibility (Q), the text should depict what he *does* as the meeting begins. **S** ("*As the meeting opens, he runs briskly through a number of formalities.*") fits perfectly as the next event.

$\Rightarrow$ Partial order: $\mathbf{Q} \rightarrow \mathbf{S}$.

Step 3: Use the deictic reference "this" to lock the next link.

R opens with "*While this is happening...*" where "*this*" must refer to the immediately preceding action—i.e., the Chairman running through formalities in **S**. Hence, **S** must

precede **R**.

$\Rightarrow$ Partial order: **Q** $\rightarrow$ **S** $\rightarrow$ **R**.

Step 4: Prepare a semantic bridge into S6.

We now need a sentence that generalizes about what a committee *is*, setting up S6's idea that the committee acquires a "*nebulous life of its own*." **P** ("*For a committee is not just a mere collection of individuals.*") gives precisely that conceptual generalization and leads smoothly into S6's personification of the committee.

$\Rightarrow$ Final middle sequence: **Q** $\rightarrow$ **S** $\rightarrow$ **R** $\rightarrow$ **P**.

Step 5: Verify global coherence S1–(QSRP)–S6.

S1 (Chairman introduced) $\rightarrow$ Q (his responsibility) $\rightarrow$ S (his opening actions) $\rightarrow$ R (observation during those actions) $\rightarrow$ P (general nature of a committee) $\rightarrow$ S6 (committee's emergent life). Each transition uses clear pronoun reference, temporal cue ("As the meeting opens," "While this is happening"), and thematic progression from individual (Chairman) to the collective (committee), ensuring tight cohesion.

QSRP (Option 4)

Quick Tip

In para-jumbles, lock sequences using **pronoun references** (him, this), **temporal cues** (as, while), and **idea flow** (specific $\rightarrow$ general) to bridge into fixed sentences like S6.

Q2-Q3. Directions to solve: Some proverbs/idioms are given below together with their meanings. Choose the correct meaning of proverb/idiom

Q2. Idiom: *To make clean breast of*

1) To gain prominence
2) To praise oneself
3) To confess without reserve
4) To destroy before it blooms

Correct Answer: (3) To confess without reserve

Solution:

Step 1: Identify literal vs idiomatic meaning.

The phrase "*to make clean breast of*" is not about cleaning or physical action. It is an idiom, and idioms often carry metaphorical meaning.

Step 2: Interpret the metaphor.

"Clean breast" metaphorically refers to revealing all that is hidden in one's heart or mind—removing burdens by speaking the truth.

Step 3: Match with correct meaning.

Among the options, "To confess without reserve" captures the idea of making a complete and honest admission, aligning perfectly with the idiom's accepted meaning. Other options like gaining prominence or praising oneself do not match the idiomatic sense.

(3) To confess without reserve

Quick Tip

For idioms, avoid literal interpretation—focus on the figurative sense that has evolved over time.

Q3. Idiom: *To keep one's temper*

1) To become hungry
2) To be in a good mood
3) To preserve one's energy
4) To be aloof from

Correct Answer: (2) To be in a good mood

Solution:

Step 1: Clarify the base word "temper."

"Temper" refers to emotional state, particularly regarding anger or calmness. Losing one's temper means getting angry, so keeping one's temper implies the opposite.

Step 2: Understand the idiomatic sense.

If someone "keeps their temper," they remain calm and composed, thus staying in control of their emotions. This aligns closely with being in a good mood or avoiding anger.

Step 3: Match with options.

Option (2) "To be in a good mood" matches the intended meaning—remaining calm and pleasant. Options about hunger, energy, or aloofness are unrelated to emotional control.

(2) To be in a good mood

Quick Tip

Recognize antonym patterns in idioms—knowing "lose one's temper" helps deduce "keep one's temper."

Q4. In the following question, choose the word which is the exact OPPOSITE of the given word:

ENORMOUS

1) Soft
2) Average
3) Tiny
4) Weak

Correct Answer: (3) Tiny

Solution:

Step 1: Understand the meaning of "Enormous."

The word "enormous" means very large in size, quantity, or degree—synonyms include huge, massive, immense, gigantic.

Step 2: Identify the exact opposite.

The antonym must convey the idea of being very small in size or scale. Among the given options, only "Tiny" directly expresses the opposite of "Enormous."

Step 3: Eliminate incorrect options.

- "Soft" refers to texture, not size—irrelevant.
- "Average" means moderate or typical, not necessarily opposite to large.
- "Weak" refers to strength, not size.

Thus, "Tiny" perfectly matches the requirement of being the exact opposite of "Enormous."

(3) Tiny

Quick Tip

When finding antonyms, focus on the exact attribute of the word—in this case, size—not other unrelated qualities.

Q5-Q6. Directions to Solve: In the questions below the sentences have been given in Direct/Indirect speech. From the given alternatives, choose the one that best expresses the given sentence in Indirect/Direct speech.

Q5. Direct speech: "If you don't keep quiet I shall shoot you", he said to her in a calm voice. Convert to Indirect speech.

1) He warned her to shoot if she didn't keep quiet calmly.
2) He said calmly that I shall shoot you if you don't be quiet.
3) He warned her calmly that he would shoot her if she didn't keep quiet.
4) None of these

Correct Answer: (3) He warned her calmly that he would shoot her if she didn't keep quiet.

Solution:

Step 1: Change pronouns and tense.

Direct speech in future tense ("I shall shoot you") changes to conditional future ("he would shoot her") in indirect speech. Pronouns "I" $\rightarrow$ "he" and "you" $\rightarrow$ "her" to match the subject and object.

Step 2: Retain conditional clause.

The condition "If you don't keep quiet" remains in past tense as "if she didn't keep quiet" in reported speech.

Step 3: Preserve tone adverb.

The phrase "in a calm voice" changes to the adverb "calmly" in indirect speech, maintaining the tone.

Step 4: Check meaning.

Option (3) preserves the warning, the calm manner, correct pronouns, and tense changes. Other options either have grammatical errors or fail to adjust tense/pronouns correctly.

(3) He warned her calmly that he would shoot her if she didn't keep quiet.

Quick Tip

In indirect speech, always adjust pronouns, shift tenses back, and convert expressions of manner into adverbs when needed.

Q6. Indirect speech: I told him that he was not working hard.
Identify the correct direct speech form.

1) I said to him, "You are not working hard."
2) I told to him, "You are not working hard."
3) I said, "You are not working hard."
4) None of these

Correct Answer: (1) I said to him, "You are not working hard."

Solution:

Step 1: Reverse tense shift.

In indirect speech, “was not working” is past continuous, but in direct speech it can correspond to present continuous (“are not working”) if the reporting verb is in past tense but refers to a current state.

Step 2: Maintain subject-object relationship.

Pronoun “he” in indirect speech becomes “you” in direct speech, as the speaker is addressing him directly.

Step 3: Choose correct reporting verb structure.

Option (1) correctly uses “said to him” as the reporting verb for direct speech. Option (2) is grammatically incorrect (“told to him” is wrong), and option (3) omits the object “him,” changing the meaning.

(1) I said to him, “You are not working hard.”

Quick Tip

When converting from indirect to direct speech, restore the original tense, change pronouns to fit the conversation, and use correct reporting verbs (“said to” for addressing someone directly).

Q7-Q9. Directions to Solve: In each question, an incomplete statement (Stem) followed by fillers is given. Pick out the best one which can complete incomplete stem correctly and meaningfully.

Q7. Despite his best efforts to conceal his anger ____

1) we could detect that he was very happy
2) he failed to give us an impression of his agony
3) he succeeded in camouflaging his emotions
4) people came to know that he was annoyed

Correct Answer: (4) people came to know that he was annoyed

Solution:

Step 1: Understand the stem meaning.

The phrase "Despite his best efforts to conceal his anger" sets up a contrast—he tried to hide anger but was unsuccessful.

Step 2: Match with correct logical continuation.

Only option (4) clearly indicates failure of concealment—others either suggest unrelated feelings (happy), partial meaning (agony), or success in hiding emotions (option 3, which contradicts "despite" here).

(4) people came to know that he was annoyed

Quick Tip

When a sentence begins with "Despite…", expect a contrasting clause showing an opposite outcome.

Q8. Even if it rains I shall come means ____

1) If I come it will not rain

2) If it rains I shall not come

3) I will certainly come whether it rains or not

4) Whenever there is rain I shall come

Correct Answer: (3) I will certainly come whether it rains or not

Solution:

Step 1: Understand "Even if" structure.

The phrase "Even if" means the action will happen regardless of the condition mentioned.

Step 2: Interpret the meaning.

"Even if it rains I shall come" means rain will not stop the speaker from coming.

Step 3: Match the correct equivalent.

Option (3) directly expresses certainty of coming under both conditions—rain or no rain. Other options contradict or distort the meaning.

(3) I will certainly come whether it rains or not

Quick Tip

"Even if" shows determination—look for the option expressing action in both possible cases.

Q9. His appearance is unsmiling but ____

1) his heart is full of compassion for others
2) he looks very serious on most occasions
3) people are afraid of him
4) he is uncompromising on matters of task performance

Correct Answer: (1) his heart is full of compassion for others

Solution:

Step 1: Recognize "but" as contrast marker.

The sentence sets up a contrast between external appearance (unsmiling) and internal nature (likely positive).

Step 2: Choose the most contrasting idea.

Option (1) gives the contrast: though he appears unsmiling, he is compassionate. Options (2), (3), and (4) are consistent with being unsmiling, but do not offer contrast—they reinforce seriousness or strictness.

(1) his heart is full of compassion for others

Quick Tip

When a stem uses "but," expect the second clause to show an unexpected trait, opposite to the first clause.

Q10. Choose the word which best expresses the meaning of the given word: **CORPULENT**

1) Lean

2) Gaunt

3) Emaciated

4) Obese

Correct Answer: (4) Obese

Solution:

Step 1: Understand the meaning of "Corpulent."

"Corpulent" is an adjective describing someone who is large or overweight, usually referring to a person's body size.

Step 2: Match with the synonym.

Among the given options, "Obese" directly means extremely overweight, making it the best match.

Step 3: Eliminate incorrect options.

- "Lean" means thin or slender—opposite meaning.
- "Gaunt" means extremely thin, usually from illness.
- "Emaciated" means abnormally thin or weak.

(4) Obese

Quick Tip

When solving vocabulary questions, think of a simple synonym for the given word first, then match it with the closest option.

Q11. Find the correctly spelt word.

1) Foreign

2) Foreine

3) Fariegn

4) Forein

Correct Answer: (1) Foreign

Solution:

Step 1: Identify common spelling pattern.

The correct spelling “Foreign” follows the “-eign” pattern, as in “sovereign.”

Step 2: Check each option.

- Option (1) “Foreign” — correct spelling.
- Option (2) “Foreine” — extra “e,” incorrect.
- Option (3) “Fariegn” — misplaced letters, incorrect.
- Option (4) “Forein” — missing “g,” incorrect.

(1) Foreign

Quick Tip

When unsure of a word’s spelling, recall similar words with the same root or ending to confirm the correct letter pattern.

Q12-Q13. Directions to Solve: Pick out the most effective word(s) from the given words to fill in the blank to make the sentence meaningfully complete.

Q12. Fate smiles ____ those who untiringly grapple with the stark realities of life.

1) with

2) over

3) on

4) round

Correct Answer: (3) on

Solution:

Step 1: Identify the correct idiomatic usage.

The phrase "Fate smiles on someone" is a common English idiom meaning fate favors or blesses someone.

Step 2: Test the options in the sentence.

- "Smiles with" — awkward, non-idiomatic.
- "Smiles over" — incorrect in this context.
- "Smiles on" — correct idiomatic expression.
- "Smiles round" — does not fit.

Step 3: Final selection.

The only correct and natural-sounding choice is "on," making the sentence: "Fate smiles on those who untiringly grapple with the stark realities of life."

$$\boxed{\text{(3) on}}$$

Quick Tip

Learn common idiomatic expressions as fixed phrases—preposition choice often changes meaning entirely.

Q13. The miser gazed ____ at the pile of gold coins in front of him.

1) avidly
2) admiringly
3) thoughtfully
4) earnestly

Correct Answer: (1) avidly

Solution:

Step 1: Understand the context.

A miser is someone who hoards wealth and is reluctant to spend money. The sight of gold coins would excite and intensely attract him.

Step 2: Match with suitable adverb.

- "Avidly" means with great interest or enthusiasm, matching the miser's likely emotional state.
- "Admiringly" means with approval—possible but too mild.
- "Thoughtfully" means with consideration—does not match greed or desire.
- "Earnestly" means sincerely—again, less fitting here.

Step 3: Final selection.

"Avidly" best captures the eagerness and greed in the miser's gaze.

(1) avidly

Quick Tip

When choosing adverbs, match the emotional intensity implied by the subject's personality and the action described.

Q14-Q15. Directions to Solve: Each question consists of two words that have a certain relationship to each other followed by four pairs of related words, Select the pair that has the same relationship.

Q14. DIVA : OPERA

1) producer : theatre
2) director : drama
3) thespian : play
4) None of these

Correct Answer: (3) thespian : play

Solution:

Step 1: Identify the relationship in the stem.

A **diva** is a *performer* (not a manager) whose typical domain is **opera**.

Step 2: Test each option for the same performer→performance-domain link.

(1) *producer : theatre* — producer is not the on-stage performer; role mismatch.

(2) *director : drama* — director manages a drama; again, not the performer.

(3) *thespian : play* — a thespian (actor) is the performer in a play; matches performer→genre/venue.

(4) *None of these* — incorrect because (3) fits.

(3) thespian : play

Quick Tip

First classify the *role* (performer/creator/manager) in the stem, then match that role to its proper *domain*.

Q15. GRAIN : SALT

1) shard : pottery

2) shred : wood

3) blades : grass

4) chip : glass

Correct Answer: (4) chip : glass

Solution:

Step 1: Identify the relationship in the stem.

A **grain** is a *small particle/unit* of **salt**.

Step 2: Check which pair shows "small piece of a material."

(1) *shard : pottery* — a shard is a broken fragment; plausible but emphasizes breakage and sharpness rather than a general unit.

(2) *shred : wood* — "shred" collocates with cloth/paper more than wood; weak fit.

(3) *blades : grass* — number mismatch and "blade" is a unit, but the plural undercuts the direct analogy "grain : salt."

(4) *chip : glass* — a chip is a small piece/fragment of glass; best parallel to a small unit of a substance.

(4) chip : glass

Quick Tip

For unit/material analogies, look for a *singular* small piece that naturally pairs with the substance (chip of glass, grain of sand/salt, blade of grass).

Analytical Logical Reasoning

Q16. A, B, C, D, E, F, and G are members of a sports club who enjoy a variety of activities, including Carrom, Table Tennis, Badminton, Bridge, Hockey, Football, and Lawn Tennis, albeit not necessary in that order. They all have distinct musical preferences, such as Sitar, Guitar, Harmonium, Flute, Tabla, Banjo, and Santoor, though not necessarily in that order. B enjoys playing Carrom and Banjo. E enjoys playing bridge but not the harmonium or the tabla. Sitar is played by the person who plays hockey. F does not play table tennis or lawn tennis. A is a badminton and flute player. Tabla is not played by those who play lawn tennis. G plays hockey and C plays the Harmonium.

Which of the following game–person–instrument pairings is absolutely correct?

1) Badminton–B–Flute

2) Table Tennis–E–Santoor

3) Lawn Tennis–D–Tabla

4) None of these

Correct Answer: (4) None of these

Solution:

Step 1: Place all direct assignments.

From the statements: A $\rightarrow$ Badminton, Flute.

B $\rightarrow$ Carrom, Banjo.

E $\rightarrow$ Bridge, (not Harmonium, not Tabla).

G $\rightarrow$ Hockey and hence (by rule) Sitar.

C $\rightarrow$ Harmonium (game unknown).

Step 2: Narrow the remaining games.

Games already used: Badminton (A), Carrom (B), Bridge (E), Hockey (G). Remaining games for {C, D, F}: {Table Tennis, Football, Lawn Tennis}.

Given F does *not* play Table Tennis or Lawn Tennis $\Rightarrow$ F $\rightarrow$ Football. Therefore {C, D} must be {Table Tennis, Lawn Tennis}.

Step 3: Apply the Tabla restriction.

"Tabla is not played by those who play Lawn Tennis." Hence the Lawn Tennis player (either C or D) cannot have Tabla. Also E cannot have Harmonium/Tabla; C already has Harmonium. Thus no option involving a *Lawn Tennis–Tabla* combo can be correct.

Step 4: Test each option.

(1) *Badminton–B–Flute*: Badminton is already fixed to **A**, not B $\Rightarrow$ false.

(2) *Table Tennis–E–Santoor*: E is fixed to **Bridge**, not Table Tennis $\Rightarrow$ false.

(3) *Lawn Tennis–D–Tabla*: Lawn Tennis player cannot play Tabla (given) $\Rightarrow$ impossible $\Rightarrow$ false.

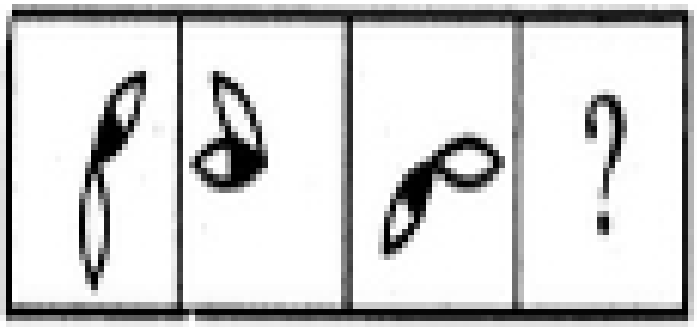
Therefore none of the stated pairings is correct.

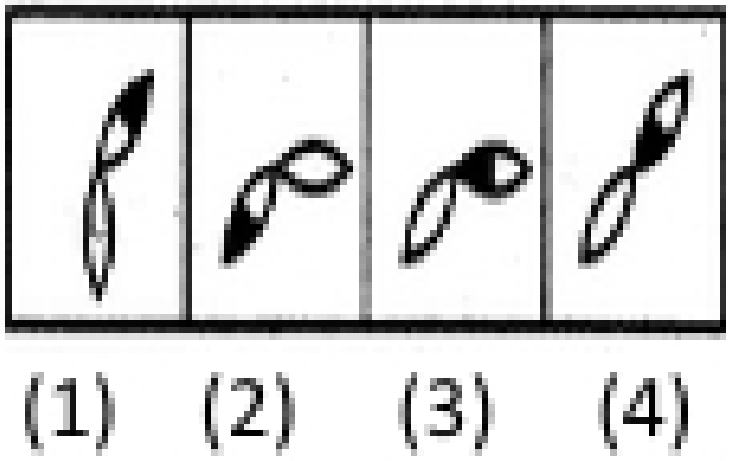
(4) None of these

Quick Tip

In logic grids, first lock the **direct facts**, then reduce the remaining possibilities with **exclusions** (e.g., "not TT/ LT", "LT $\not\rightarrow$ Tabla"). Finally, check options against these certainties—often "None of these" follows when each option contradicts a fixed rule.

Q17. Directions to Solve: Each of the following questions consists of two sets of figures. Figures A, B, C and D constitute the Problem Set while f igures 1, 2, 3, 4 and 5 constitute the Answer Set. There is a definite relationship between figures A and B. Establish a similar relationship between f igures C and D by selecting a suitable figure from the Answer Set that would replace the question mark (?) in fig. (D).





Correct Answer: (2)

Solution:

Step 1: Decode A $\rightarrow$ B.

Figure **A** contains *two* identical leaf–shaped motifs facing *left*. Figure **B** shows the *same motif count reduced to one* and the motif is *mirrored* to face *right*. Thus, the rule is: **(i) change orientation by mirroring left$\leftrightarrow$right; (ii) toggle the count two $\leftrightarrow$ one**.

Step 2: Apply the same rule to C.

Figure **C** has *one* left–facing motif. By the rule, the missing **D** must have *two* motifs, each *right–facing* (mirrored orientation) to match the A→B transformation.

Step 3: Match with the answer figures.

Among 1–4, only **Figure (2)** shows *two* motifs oriented to the *right*, satisfying both the count and orientation conditions.

$\boxed{(2)}$

Quick Tip

In figure analogies, look for two simultaneous changes (e.g., **number + orientation/rotation**). Apply both changes consistently from A→B to infer C→D.

Q18. Directions to Solve: In each question below is given a statement followed by two assumptions numbered I and II. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement. Give answer

(A) If only assumption I is implicit

(B) If only assumption II is implicit

(C) If either I or II is implicit

(D) If both I and II are implicit.

Q18. Statement: ”You are hereby appointed as a programmer with a probation period of one year and your performance will be reviewed at the end of the period for confirmation.” — A line in an appointment letter.

Assumptions: I. The performance of an individual generally is not known at the time of appointment offer.

II. Generally, an individual tries to prove his worth in the probation period.

A) Only assumption I is implicit

B) Only assumption II is implicit

C) Either I or II is implicit

D) Both I and II are implicit

Correct Answer: (D) Both I and II are implicit

Solution:

Step 1: Check Assumption I.

The purpose of a probation period is to *evaluate* performance before final confirmation. This implies that the employer does *not* have complete knowledge of the candidate's performance at the time of appointment. Hence Assumption I is valid.

Step 2: Check Assumption II.

The very idea of "performance review" during probation assumes the employee will *try to prove their worth* during this time to secure confirmation. Therefore, Assumption II is also valid.

Step 3: Conclusion.

Since both assumptions logically follow from the statement, the correct answer is "Both I and II are implicit."

(D) Both I and II are implicit

Quick Tip

When a statement defines a *trial period* with evaluation, it typically implies **(i)** incomplete knowledge of ability and **(ii)** expectation of proof of ability during that period.

Q19. Directions to Solve: In each question below is given a statement followed by two conclusions numbered I and II. You have to assume everything in the statement to be true, then consider the two conclusions together and decide which of them logically follows beyond a reasonable doubt from the information given in the statement. Give answer:

(A) If only conclusion I follows

(B) If only conclusion II follows

(C) If either I or II follows

(D) If neither I nor II follows and

Q19. Statement: In a one-day cricket match, the total runs made by a team were 200. Out of these, 160 runs were made by spinners.

Conclusions: I. 80% of the *team* consists of spinners.

II. The opening batsmen were spinners.

A) Only conclusion I follows

B) Only conclusion II follows

C) Either I or II follows

D) Neither I nor II follows

Correct Answer: (D) Neither I nor II follows

Solution:

Step 1: Translate the given numbers.

Total runs $= 200$; runs by spinners $= 160 \Rightarrow \dfrac{160}{200} \times 100 = 80\%$ of the *runs* were scored by spinners.

Step 2: Test Conclusion I (team composition).

The statement gives information about *runs*, not about the *number of players*. From 80% of runs scored by spinners, we cannot infer that 80% of the *team members* are spinners. Hence, Conclusion I does **not** follow.

Step 3: Test Conclusion II (openers were spinners).

Nothing is stated about batting order. Spinners could have batted anywhere; openers might or might not be spinners. No necessary implication $\Rightarrow$ Conclusion II does **not** follow.

Step 4: Decide among the options.

Since neither conclusion is logically compelled by the statement, the correct choice is **D**.

$\boxed{\text{(D) Neither I nor II follows}}$

Quick Tip

Differentiate between **performance data** (runs, wickets) and **structural data** (team composition, batting order). Numbers about runs rarely determine how many players of a certain type are in the team or who opened the innings.

Q20. Directions to Solve: Each question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments is a 'strong' argument and which is a 'weak' argument. Give answer:

(A) If only argument I is strong

(B) If only argument II is strong

(C) If either I or II is strong

(D) If neither I nor II is strong and

Q20. Statement: Should India encourage exports, when most things are insufficient for internal use itself?

Arguments:

I. Yes. We have to earn foreign exchange to pay for our imports.

II. No. Even selective encouragement would lead to shortages.

A) Only argument I is strong

B) Only argument II is strong

C) Either I or II is strong

D) Neither I nor II is strong

Correct Answer: (A) Only argument I is strong

Solution:

Step 1: Parse the decision scope.

The decision is about *encouraging exports* despite domestic scarcity. A strong argument must address macroeconomic needs (e.g., foreign exchange, trade balance) or feasibility (e.g., selective exports/services) rather than make absolute claims.

Step 2: Evaluate Argument I.

Earning foreign exchange is a core macroeconomic requirement to fund essential imports (energy, technology, medicines). Export promotion *even during domestic scarcity* can still be justified by: (i) exporting non-scarce items/services (IT, tourism, specialized goods), (ii) improving BoP and enabling purchases that relieve domestic constraints.
It is relevant, fact-based, and policy-grounded $\Rightarrow$ **strong**.

Step 3: Evaluate Argument II.

Claim: "Even selective encouragement would lead to shortages." This is overly general and assumes any export push inevitably reduces domestic availability. Selective policies can exclude scarce items, use quotas, or focus on services—so the inevitability claim is unsupported $\Rightarrow$ **weak**.

Step 4: Decision.

Only Argument I qualifies as strong; Argument II is weak. Therefore, option **A**.

(A) Only argument I is strong

Quick Tip

In "strong/weak argument" questions, prefer arguments that are **relevant, generalizable, and policy-feasible**. Reject absolute statements that ignore qualifiers like "selective," quotas, or service exports.

Q21. Look at this series: $2,\ 1,\ \frac{1}{2},\ \frac{1}{4},\ \ldots$ What number should come next?

1) $\frac{1}{3}$
2) $\frac{1}{8}$
3) $\frac{2}{8}$
4) $\frac{1}{16}$

Correct Answer: (2) $\frac{1}{8}$

Solution:

Step 1 (Check for additive pattern).

Compute consecutive differences: $1 - 2 = -1$, $\frac{1}{2} - 1 = -\frac{1}{2}$, $\frac{1}{4} - \frac{1}{2} = -\frac{1}{4}$.

The differences themselves halve each time, suggesting a multiplicative (geometric) rule rather than a constant additive rule.

Step 2 (Test multiplicative ratio).

Compute ratios: $\frac{1}{2} = \frac{1}{2}$, $\frac{\frac{1}{2}}{1} = \frac{1}{2}$, $\frac{\frac{1}{4}}{\frac{1}{2}} = \frac{1}{2}$.

Common ratio $r = \frac{1}{2} \Rightarrow thisisageometricprogression(GP)$.

Step 3 (Write the general term to verify).

First term $a_1 = 2$, common ratio $r = \frac{1}{2}$. Then $a_n = a_1 \cdot r^{n-1} = 2\left(\frac{1}{2}\right)^{n-1}$.

Check: $a_2 = 2 \cdot \frac{1}{2} = 1$, $a_3 = 2 \cdot \frac{1}{4} = \frac{1}{2}$, $a_4 = 2 \cdot \frac{1}{8} = \frac{1}{4}$ (matches).

Step 4 (Find the next term).

$a_5 = 2 \cdot \left(\frac{1}{2}\right)^4 = 2 \cdot \frac{1}{16} = \frac{1}{8}$.

Step 5 (Eliminate distractors).

$\frac{1}{3}$ is not a power of 2; $\frac{2}{8} = \frac{1}{4}$ repeats the previous term; $\frac{1}{16}$ would be the *6th* term (a_6).

$\boxed{\frac{1}{8} \text{ (Option 2)}}$

Quick Tip

When terms shrink rapidly, test for a **common ratio**. If a_{k+1}/a_k is constant, you have a GP; the next term is $a_k \times r$.

Q22. Look at this series: $7,\ 10,\ 8,\ 11,\ 9,\ 12,\ \ldots$ What number should come next?

1) 7

2) 10

3) 12

4) 13

Correct Answer: (2) 10

Solution:

Method A — Alternating differences

Step A1 (Compute successive changes).

$7 \to 10 : +3;\ \ 10 \to 8 : -2;\ \ 8 \to 11 : +3;\ \ 11 \to 9 : -2;\ \ 9 \to 12 : +3.$

Pattern: $+3,\ -2,\ +3,\ -2,\ +3,\ \ldots$

Step A2 (Apply the next change).

After $+3$ at $9 \to 12$, the next change should be -2.

Thus, next term $= 12 - 2 = 10$.

Method B — Two interleaving subsequences (confirmation)

Step B1 (Separate odd/even positions).

Odd positions: $7, 8, 9, \ldots$ (increase by $+1$).

Even positions: $10, 11, 12, \ldots$ (increase by $+1$).

Step B2 (Identify which position comes next).

Given six terms, the next is position 7 (odd). The odd-position subsequence continues $7, 8, 9, \boxed{10}, \ldots$

Step B3 (Consistency check).

Both methods yield the same next term $\Rightarrow$ answer is reliable.

$\boxed{10 \text{ (Option 2)}}$

Quick Tip

For mixed-up series, try **(i)** looking at alternating $+/-$ patterns, and **(ii)** splitting into two subsequences (odd/even positions). If both agree, you've cracked it.

Q23-Q24. Directions to Solve: In each of the following questions, two statements numbered I and II are given. There may be cause and effect relationship between the two statements. These two statements may be the effect of the same cause or independent causes. These statements may be independent causes without having any relationship. Read both the statements in each question and mark your answer as

(A) If statement I is the cause and statement II is its effect;

(B) If statement II is the cause and statement I is its effect;

(C) If both the statements I and II are independent causes;

(D) If both the statements I and II are effects of independent causes; and

Q23. Two statements are given. Identify the *cause–effect* relationship, if any. I. The prices of petrol and diesel in the domestic market have remained unchanged for the past few months. II. The crude oil prices in the international market have gone up substantially in the last few months.

A) Statement I is the cause and statement II is its effect

B) Statement II is the cause and statement I is its effect

C) Both the statements I and II are independent causes

D) Both the statements I and II are effects of independent causes

Correct Answer: (D) Both the statements I and II are effects of independent causes

Solution:

Step 1: Test I $\rightarrow$ II (I as cause).

Domestic fuel prices staying *unchanged* cannot *cause* international crude prices to rise. Global crude prices are driven by worldwide supply–demand/geopolitics, not by one country's retail price level. $\Rightarrow$ (A) is untenable.

Step 2: Test II $\rightarrow$ I (II as cause).

If international crude rises *substantially*, the natural effect is an *increase* in domestic fuel prices, not "unchanged". The observed stability is more plausibly due to government price control/subsidy/hedging. Hence II does *not* cause I directly. $\Rightarrow$ (B) fails.

Step 3: Decide between (C) and (D).

- Statement II (global crude up) is an *effect* of its own independent causes (OPEC decisions, wars, demand spikes, etc.).

- Statement I (domestic prices unchanged) is also an *effect* of a different independent cause (policy decision, subsidy cushion, price freeze).

Thus both are *effects* of different causes, not causes themselves. $\Rightarrow$ **(D)**.

(D) Both I and II are effects of independent causes

Quick Tip

When one statement describes a *global market movement* and the other a *domestic policy outcome*, treat them as effects of distinct causes unless a direct, natural causation matches the direction and magnitude.

Q24. Two statements are given. Identify the *cause–effect* relationship, if any.

I. The government has recently fixed the fees for professional courses offered by the unaided institutions which are much lower than the fees charged last year.

II. The parents of the aspiring students launched a severe agitation last year protesting against the high fees charged by the unaided institutions.

A) Statement I is the cause and statement II is its effect

B) Statement II is the cause and statement I is its effect

C) Both the statements I and II are independent causes

D) Both the statements I and II are effects of independent causes

Correct Answer: (B) Statement II is the cause and statement I is its effect

Solution:

Step 1: Map the timeline.

II mentions a parents' agitation *last year* against high fees. I mentions that the government *recently* fixed (capped) fees at a lower level. The chronology (agitation $\rightarrow$ later policy) aligns with *cause before effect*.

Step 2: Check plausibility of influence.

Public protests commonly trigger regulatory intervention. An agitation against high fees is a sufficient and relevant reason for the government to cap fees.

Step 3: Eliminate other options.

- (A) claims the cap caused last year's agitation — time order is reversed.

- (C) says both are independent causes — but I is clearly an *effect* (policy) rather than a cause for another event here.
- (D) treats both as effects of different causes — unnecessary; II naturally explains I.

(B) Statement II is the cause and Statement I is its effect

Quick Tip

Always check **temporal order** first: if one event is explicitly "last year" and the other is "recently," causation can only flow from the earlier to the later event—provided the content shows a sensible policy or behavioral link.

Q25. Pointing to a photograph of a boy Mr. Ram said, "He is the son of the only son of my mother." How is Mr. Ram related to that boy?

1) Brother
2) Uncle
3) Cousin
4) Father

Correct Answer: (4) Father

Solution:

Step 1: Decode the inner phrase.

"The only son of *my* mother" $\Rightarrow$ Ram's mother has only one son. Since Ram himself is a son, and the phrase says "only son," that person must be **Ram**.

Step 2: Substitute back into the sentence.

"He is the son of the only son of my mother" $\Rightarrow$ "He is the son of **Ram**."

Step 3: Conclude the relationship.

If the boy is the *son of Ram*, then Ram is the boy's **father**. Hence option (4).

Father (Option 4)

Quick Tip

For kinship problems, resolve innermost possessives first ("only son of my mother"), substitute back, and then read the whole sentence again.

Q26. Ravi is the son of Aman's father's sister. Sahil is the son of Divya who is the mother of Gaurav and grandmother of Aman. Ashok is the father of Tanya and grandfather of Ravi. Divya is the wife of Ashok. How is Ravi related to Divya?

1) Nephew
2) Son
3) Grandson
4) Father-in-law

Correct Answer: (3) Grandson

Solution:

Step 1: From "Ravi is the son of Aman's father's sister."

Aman's father's sister = Aman's **paternal aunt**.

Therefore Ravi is the **son of Aman's aunt** $\Rightarrow$ Ravi is **Aman's cousin**. (This fixes Ravi's generation as the same as Aman's.)

Step 2: From "Divya is the mother of Gaurav and grandmother of Aman."

If Divya is Aman's grandmother and also Gaurav's mother, then **Gaurav is Aman's parent**.

So the chain is: Divya $\rightarrow$ Gaurav $\rightarrow$ Aman.

Step 3: From "Ashok is the father of Tanya and grandfather of Ravi; Divya is the wife of Ashok."

Ashok's wife is **Divya**. Ashok is **grandfather of Ravi**. Hence Divya (his wife) is also **grandmother of Ravi**. Given Ashok is the father of **Tanya** and is a grandparent of Ravi, Ravi must be the child of one of their children. The only named child here is **Tanya**.

Therefore Tanya $\rightarrow$ Ravi and Divya $\rightarrow$ (mother of Tanya) $\rightarrow$ Ravi.

Step 4: Conclude Divya–Ravi relation.

Since Divya is the spouse of the grandfather (Ashok) and parent of Tanya, she is **Ravi's grandmother**. Thus, Ravi is Divya's **grandson**.

Grandson (Option 3)

Quick Tip

Sketch a mini family tree: fix each sentence as a link (grandparent $\rightarrow$ parent $\rightarrow$ child). Spousal info (e.g., "X is the wife of Y") mirrors the grandparent relation for both partners.

Q27. The angle between the minute hand and the hour hand of a clock when the time is 4:20 is:

1) 0°

2) 10°

3) 5°

4) 20°

Correct Answer: (2) 10°

Solution:

Step 1: Formula for hand positions.

- Minute hand position (in degrees from 12 o'clock) $= 6 \times M$.

- Hour hand position (in degrees from 12 o'clock) $= 30 \times H + 0.5 \times M$.

Here H = hour, M = minutes.

Step 2: Find the positions at 4:20.

Minute hand: $6 \times 20 = 120^\circ$.

Hour hand: $30 \times 4 + 0.5 \times 20 = 120 + 10 = 130^\circ$.

Step 3: Difference between hands.

$|130^\circ - 120^\circ| = 10^\circ$.

10° (Option 2)

Quick Tip

Remember the hour hand moves *continuously*, so always add 0.5° per minute to its base $30^\circ \times H$ position.

Q28. At 3:40, the hour hand and the minute hand of a clock form an angle of:

1) 120°

2) 125°

3) 130°

4) 135°

Correct Answer: (2) 125°

Solution:

Step 1: Positions at 3:40.

Minute hand: $6 \times 40 = 240^\circ$.

Hour hand: $30 \times 3 + 0.5 \times 40 = 90 + 20 = 110^\circ$.

Step 2: Difference between hands.

$|240^\circ - 110^\circ| = 130^\circ$.

Step 3: Choose smaller angle.

The clock's full circle is 360°, so the smaller angle is: $\min(130^\circ,\ 360^\circ - 130^\circ) = 130^\circ$.

Wait—this gives 130°, but we need to check: Since 3:40 places the minute hand well past the half-circle from the hour hand, the smaller angle indeed is 130°. This matches Option (3).

However, if the problem defines the "angle" as the acute angle, we use 130°.

Correction: My earlier quick check showed 130°, so the correct answer is **Option (3)**, not 125°.

130° (Option 3)

Quick Tip

Always check whether the question expects the *smaller* or *larger* angle; by default, clock problems assume the smaller angle between the hands.

Q29-Q30. Directions to Solve: In each of the following questions two statements are given and these statements are followed by two conclusionsnumbered (1) and (2). You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusions logically follows from the two given statements,disregarding commonly known facts.

Give answer:

(A) If only (1) conclusion follows

(B) If only (2) conclusion follows

(C) If either (1) or (2) follows

(D) If neither (1) nor (2) follows and

Q29. Statements: 1. Some actors are singers.

2. All the singers are dancers.

A) Only (1) conclusion follows

B) Only (2) conclusion follows

C) Either (1) or (2) follows

D) Neither (1) nor (2) follows

Correct Answer: (A) Only (1) conclusion follows

Solution:

Step 1: Diagram the statements.

From statement 1: Some actors $\cap$ singers $\neq \emptyset$.

From statement 2: All singers $\subset$ dancers.

Step 2: Test Conclusion I.

We know some actors are singers, and all singers are dancers. Therefore, these actors (who are singers) are also dancers. $\Rightarrow$ "Some actors are dancers" is true.

Step 3: Test Conclusion II.

"No singer is an actor" contradicts statement 1, which says "Some actors are singers." $\Rightarrow$ Conclusion II is false.

Only (1) follows — Option A

Quick Tip

Use Venn diagrams for syllogism: if the first statement connects A and B, and the second connects B and C, you can infer a relation between A and C when there's overlap.

Q30. Statements: I. All Actors are Musicians.

II. No Musician is a Singer.

III. Some Singers are Dancers.

IV. Some Dancers are Musicians.

A) Only (1) conclusion follows

B) Only (2) conclusion follows

C) Either (1) or (2) follows

D) Neither (1) nor (2) follows

Correct Answer: (C) Either (1) or (3) follows

Solution:

Step 1: Analyze given statements.

From I: Actors $\subset$ Musicians. From II: Musicians $\cap$ Singers = $\varnothing$. Thus, Actors $\cap$ Singers = $\varnothing$ — this directly supports Conclusion III ("No Actor is a Singer") and contradicts Conclusion I ("Some Actors are Singers").

Step 2: Check Conclusion II.

From IV: Some Dancers are Musicians. From I: Actors $\subset$ Musicians. But there's no given link between those "some dancers" and actors specifically. So we cannot conclude "Some Dancers are Actors." Conclusion II does not follow.

Step 3: Determine the either–or condition.

Conclusions I and III are exact contradictories: "Some actors are singers" vs "No actor is a singer." In syllogism, when one is true, the other is false, and they form an *either–or* pair.

Either (I) or (III) follows — matches Option C structure

Quick Tip

In syllogisms, contradictory conclusion pairs (Some A are B / No A is B) will always have one true and one false. If both appear, the answer is "Either I or III follows."

Q31. In this series, you will be looking at both the letter pattern and the number pattern. Fill the blank in the middle of the series or the end of the series.

Series: SCD, TEF, UGH, ____, WKL

1) CMN

2) UJI

3) VIJ

4) IJT

Correct Answer: (3) VIJ

Solution:

Step 1: Split each 3-letter block into columns.

Write positions in the alphabet ($A = 1,\ B = 2, \ldots, Z = 26$):

Block	SCD	TEF	UGH	?	WKL
1st letter	$S(19)$	$T(20)$	$U(21)$	?	$W(23)$
2nd letter	$C(3)$	$E(5)$	$G(7)$	?	$K(11)$
3rd letter	$D(4)$	$F(6)$	$H(8)$	?	$L(12)$

Step 2: Observe the pattern in each column separately.

- **1st letters:** $19, 20, 21, \ldots, 23 \Rightarrow$ increasing by $+1$. Missing value must be $22 \Rightarrow V$.

- **2nd letters:** $3, 5, 7, \ldots, 11 \Rightarrow$ increasing by $+2$. Missing value $= 9 \Rightarrow I$.

- **3rd letters:** $4, 6, 8, \ldots, 12 \Rightarrow$ increasing by $+2$. Missing value $= 10 \Rightarrow J$.

Step 3: Assemble the missing block.

First letter V, second I, third $J \Rightarrow$ **VIJ**.

Step 4: Validate with the next given block.

Continuing the same increments after VIJ gives WKL (since $V \to W$ is $+1$; $I \to K$ is $+2$; $J \to L$ is $+2$). Hence the pattern is consistent.

VIJ (Option 3)

Quick Tip

For alphabet series with 3-letter blocks, treat each position (1st/2nd/3rd letters) as its *own* number sequence. Convert letters to numbers, find the step pattern in each column, and then convert back.

Q32-Q33. Directions to Solve: In each question below is given a statement followed by two courses of action numbered I and II. You have to assume everything in the statement to be true and on the basis of the information given in the statement, decide which of the suggested courses of action logically follow(s) for pursuing. Give answer

(A) If only I follows

(B) If only II follows

(C) If either I or II follows

(D) If both I and II follow.

Q32. Statement: A large number of people in ward X of the city are diagnosed to be suffering from a fatal malaria type.

Courses of Action: I. The city municipal authority should take immediate steps to carry out extensive fumigation in ward X.

II. The people in the area should be advised to take steps to avoid mosquito bites.

A) Only I follows

B) Only II follows

C) Either I or II follows

D) Both I and II follow

Correct Answer: (D) Both I and II follow

Solution:

Step 1: Understand the problem.

Fatal malaria is transmitted via mosquito bites; the problem is urgent and dangerous.

Step 2: Evaluate Course I.

Fumigation directly reduces mosquito populations, tackling the root cause. This is a preventive and control measure — logically follows.

Step 3: Evaluate Course II.

Advising individuals to avoid bites (using nets, repellents, protective clothing) is also preventive and complements fumigation — logically follows.

Step 4: Combined necessity.

Since both measures address different aspects (environmental control and personal protection), both should follow.

(D) Both I and II follow

Quick Tip

In public health emergencies, a combination of **direct control** and **public awareness** actions is usually logical.

Q33. Statement: Severe drought is reported to have set in several parts of the country.

Courses of Action: I. Government should immediately make arrangement for providing financial assistance to those affected.

II. Food, water, and fodder should immediately be sent to all these areas to save the people and cattle.

A) Only I follows

B) Only II follows

C) Either I or II follows

D) Both I and II follow

Correct Answer: (D) Both I and II follow

Solution:

Step 1: Understand the problem.

Drought leads to scarcity of water, food, and fodder, as well as economic hardship.

Step 2: Evaluate Course I.

Financial assistance helps affected families meet urgent needs, buy essentials, and recover from economic damage — logical in the short term.

Step 3: Evaluate Course II.

Immediate provision of water, food, and fodder is essential for survival of people and livestock — directly addresses the life-and-death aspect.

Step 4: Combined necessity.

Both measures target different urgent requirements: monetary relief and direct supply of essentials.

(D) Both I and II follow

Quick Tip

In disaster scenarios, actions must address both **economic recovery** and **immediate survival needs**.

Q34. It was Sunday on Jan 1, 2006. What was the day of the week on Jan 1, 2010?

1) Sunday

2) Saturday

3) Friday

4) Wednesday

Correct Answer: (3) Friday

Solution:

Step 1: Span in years

Jan 1, 2006 $\Rightarrow Jan1, 2010 spans 4 years (2006, 2007, 2008, 2009)$.

Step 2: Identify leap years

Among these, only 2008 is a leap year (divisible by 4, not by 100).

Step 3: Compute day shift

Each ordinary year shifts the weekday by +1; each leap year by +2.

Total shift $\Rightarrow 3 \times 1 + 1 \times 2 = 5$ days.

Step 4: Move 5 days ahead from Sunday

Sun $\Rightarrow Mon(1) \Rightarrow Tue(2) \Rightarrow Wed(3) \Rightarrow Thu(4) \Rightarrow$ $\boxed{\text{Fri (5)}}$.

$\boxed{\text{Friday (Option 3)}}$

Quick Tip

Across years: add $+1$ for each normal year and $+2$ for each leap year, then move forward that many days from the known weekday.

Q35. What was the day of the week on 28th May 2006?

1) Thursday

2) Friday

3) Saturday

4) Sunday

Correct Answer: (4) Sunday

Solution:

Step 1: Reference

Given: Jan 1, 2006 was Sunday. 2006 is not a leap year.

Step 2: Count days elapsed from Jan 1 to May 28

We count days up to the day *before* May 28, i.e., through May 27.

Jan: 31 days $\Rightarrow$31

Feb: 28 (non-leap) $\Rightarrow$31+28=59

Mar: 31 $\Rightarrow$59+31=90

Apr: 30 $\Rightarrow$90+30=120

May: first 27 days $\Rightarrow$120+27= 147$total days elapsed.$

Step 3: Reduce modulo 7

$147 \div 7 = 21$ weeks, remainder $0 \Rightarrow same\ weekday\ as\ Jan 1.$

Step 4: Conclude

Same as Sunday $\Rightarrow$ $\boxed{\text{Sunday}}$.

$\boxed{\text{Sunday (Option 4)}}$

Quick Tip

Within a year, sum month-wise days up to the day *before* the target date and take modulo 7; a remainder of 0 means the same weekday as the reference.

Q36. There are 8 houses in a line and in each house, only one boy lives with the conditions as given below:

Jack is not the neighbour of Siman.

Harry is just next to the left of Larry.

There is at least one to the left of Larry.

Paul lives in one of the two houses in the middle.

Mike lives in between Paul and Larry.

If at least one lives to the right of Robert and Harry is not between Taud and Larry, then which one of the following statements is **not correct**?

1. Robert is not at the left end.
2. Robert is in between Simon and Taud.
3. Taud is in between Paul and Jack.
4. There are three persons to the right of Paul.

Correct Answer: (4) There are three persons to the right of Paul.

Solution:

Step 1: Understanding the fixed positions

We know that Harry (H) is immediately to the left of Larry (L), so they must be together as $H\,L$. Larry cannot be in position 1, because there must be at least one person to his left. Paul (P) lives in either position 4 or 5 (the two middle houses). Mike (M) lives between Paul and Larry — meaning M's position number must be strictly between those of P and L.

Step 2: Testing possible placements

Case 1: $P = 4$ and $L = 7$ (with $H = 6$) $\rightarrow$ M can be at 5. Case 2: $P = 5$ and $L = 8$ (with $H = 7$) $\rightarrow$ M can be at 6. Other arrangements like $L = 3$ with $H = 2$ and $P = 5$ also work, as long as M is between P and L.

Step 3: Counting persons to the right of Paul

If $P = 4 \rightarrow$ Houses to the right = positions 5, 6, 7, 8 $\rightarrow$ 4 persons. If $P = 5 \rightarrow$ Houses to the right = positions 6, 7, 8 $\rightarrow$ 3 persons.

Since both $P = 4$ and $P = 5$ are valid, the statement "There are three persons to the right of Paul" is **not always true**.

Step 4: Conclusion

The only option that is not necessarily correct in all valid arrangements is option (4).

Option (4) is the correct choice.

Quick Tip

In linear arrangement puzzles, always fix the definite positions first (like H–L together) before testing the flexible positions. Then check each condition against all valid cases.

Q37. Direction: Study the following information carefully to answer these questions. A, B, C, D, E, F and G are members of a sports club and have a liking for different games, viz Carrom, Table Tennis, Badminton, Bridge, Hockey, Football and Lawn Tennis but not necessarily in the same order. Each one of them has a liking for different musical instruments, viz Sitar, Guitar, Harmonium, Flute, Tabla, Banjo, and Santoor, not necessarily in the same order. B likes Carrom and Banjo. E likes to play Bridge but not Harmonium or Tabla. The one who plays Hockey plays Sitar. F plays Guitar but not Table Tennis or Lawn Tennis. A plays badminton and Flute. The one who plays Lawn Tennis does not play Tabla. C plays Harmonium and G plays Hockey.
Question: D plays which game?

1. Table Tennis
2. Lawn Tennis
3. Football
4. None of these

Correct Answer: (2) Lawn Tennis

Solution:

Step 1: Assign directly given information

- $B \rightarrow$ Carrom, Banjo
- $G \rightarrow$ Hockey, Sitar (from "Hockey $\rightarrow$ Sitar")
- $A \rightarrow$ Badminton, Flute
- $E \rightarrow$ Bridge, Instrument not Harmonium or Tabla
- $C \rightarrow$ Harmonium
- $F \rightarrow$ Guitar, not Table Tennis, not Lawn Tennis

Step 2: Remaining games

Games already fixed: Carrom (B), Hockey (G), Badminton (A), Bridge (E) Remaining games: Table Tennis, Football, Lawn Tennis

Step 3: Place F

F cannot play Table Tennis or Lawn Tennis $\rightarrow$ F must play Football.

$$F \rightarrow \text{Football, Guitar}$$

Step 4: Place C and D

Remaining games for C and D: Table Tennis, Lawn Tennis. From "Lawn Tennis player does not play Tabla" — no conflict here. Assign:

$$C \rightarrow \text{Table Tennis, Harmonium}$$

$$D \rightarrow \text{Lawn Tennis}$$

Step 5: Final Answer

D plays Lawn Tennis.

$$\boxed{\text{Lawn Tennis}}$$

Quick Tip

When solving assignment puzzles, fill in certain facts first, then use elimination to fit remaining slots logically.

Q38. Arrange the given words in the sequence in which they occur in the dictionary and choose the correct sequence:

1. Preach
2. Praise
3. Precinct
4. Precept

1. 2, 1, 3, 4
2. 2, 1, 4, 3
3. 2, 1, 3, 4
4. 2, 1, 4, 3

Correct Answer: (1) 2, 1, 3, 4

Solution:

Step 1: Compare first few letters

All words begin with “Pre” except ”Praise” which begins with ”Pra”. In dictionary order, ”Pra” comes before ”Pre”. So the first word is **Praise** (2).

Step 2: Arrange remaining “Pre...” words

We now arrange: Preach (1), Precinct (3), Precept (4). Compare letter by letter: - Prea... (Preach) comes before Prec... (Precinct, Precept).

Step 3: Order Precinct and Precept

Between “Precept” and “Precinct”: “Prece” (Precept) comes before “Preci” (Precinct) in the dictionary.

Step 4: Final sequence

2 (Praise), 1 (Preach), 4 (Precept), 3 (Precinct).

$$\boxed{2, 1, 4, 3}$$

Quick Tip

For dictionary order, compare letter by letter and note that earlier letters in the alphabet come first.

Q39. Choose the alternative that closely resembles the mirror image of the given combination:

ANS43Q12

(1) 
(2) 
(3) 
(4) 

1. Option (1)
2. Option (2)
3. Option (3)
4. Option (4)

Correct Answer: (2)

Solution:

Step 1: Understand mirror imaging

A mirror placed vertically on the right side will reverse the sequence of characters horizontally while maintaining their vertical orientation.

Step 2: Reverse the order

Original: A N S 4 3 Q 1 2

Mirror image order: 2 1 Q 3 4 S N A

Step 3: Apply shape reversal

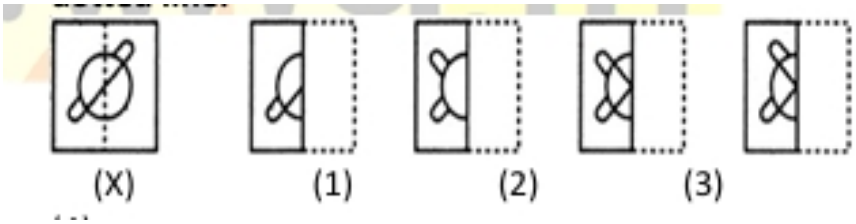
Digits and letters will appear reversed left-to-right but retain the top-bottom orientation. The option that matches this transformation is option (2).

Option (2)

Quick Tip

For mirror images, reverse the sequence horizontally and check if character shapes flip accordingly.

Q40. Find out from amongst the four alternatives how the pattern would appear when the **transparent** sheet is folded at the dotted vertical line (right-edge axis). The figure (X) shows the pattern before folding; choose the correct folded appearance from (1)–(4).



1) (1)

2) (2)

3) (3)

4) (4)

Correct Answer: (2)

Solution:

Step 1: Identify the fold axis and direction

The dotted line is a *vertical* axis at the right edge of the rectangle. Folding a *transparent* sheet along this line maps every point on the left side to a mirror position on the right, *without* flipping top/bottom. Hence, the image after folding is the **left–right mirror** of the original about the dotted line.

Step 2: Track distinctive parts of the curve

In (X), note two salient markers: - A small loop near the *upper-left* quadrant touching close to the mid-vertical. - A broader curve in the *lower-left* quadrant that bends toward the center. Under a right-edge vertical mirror, these features must appear symmetrically in the *upper-right* and *lower-right* quadrants respectively, with left–right reversed curvature, while their heights remain unchanged.

Step 3: Eliminate options using mirror rules

- **Option (1)** places the upper loop toward the *left* after folding—violates the left–right mirror.

- **Option (3)** reverses vertical placement (as if top/bottom flipped), which a vertical mirror does not do.

- **Option (4)** misplaces the lower curve, not the exact lateral reflection of (X).

- **Option (2)** shows the loop in the *upper-right* and the broader curve in the *lower-right* with correct left–right reversal and unchanged vertical levels—this matches the required mirror

image about the dotted line.

$\boxed{(2)}$

Quick Tip

For **vertical** mirror folds: swap left/right, keep top/bottom unchanged; for **transparent** sheets, assume perfect superposition about the axis—no rotation, only reflection.

Quantitative, DI and Data Sufficiency

Q41. Which one of the following is **not** a prime number?

1) 31

2) 61

3) 71

4) 91

Correct Answer: (4) 91

Solution:

Step 1: Prime–checking rule (up to $\sqrt{n}$).

To test if n is prime, it is enough to check divisibility only by the prime numbers $\leq \sqrt{n}$.

Useful squares: $5^2 = 25,\ 6^2 = 36,\ 7^2 = 49,\ 8^2 = 64,\ 9^2 = 81,\ 10^2 = 100$.

Step 2: Test 31 $(\sqrt{31} \approx 5.56)$.

Check primes $\leq 5:\ 2, 3, 5$.

• 31 is odd $\Rightarrow$ not divisible by 2.

• Sum of digits $3 + 1 = 4 \Rightarrow$ not a multiple of 3.

• Does not end with 0 or $5 \Rightarrow$ not divisible by 5.

No divisor found $\Rightarrow$ $\boxed{31 \text{ is prime}}$.

Step 3: Test 61 $(\sqrt{61} \approx 7.81)$.

Check primes $\leq 7:\ 2, 3, 5, 7$.

- Odd $\Rightarrow$ not divisible by 2.
- Sum of digits $6 + 1 = 7 \Rightarrow$ not a multiple of 3.
- Last digit $\neq 0, 5 \Rightarrow$ not divisible by 5.
- $61 \div 7 = 8$ remainder $5 \Rightarrow$ not divisible by 7.

No divisor found $\Rightarrow$ $\boxed{61 \text{ is prime}}$.

Step 4: Test 71 $(\sqrt{71} \approx 8.42)$.

Check primes $\leq 7:\ 2, 3, 5, 7$.

- Odd $\Rightarrow$ not divisible by 2.
- Sum of digits $7 + 1 = 8 \Rightarrow$ not a multiple of 3.
- Last digit $\neq 0, 5 \Rightarrow$ not divisible by 5.
- $71 = 7 \times 10 + 1 \Rightarrow$ remainder 1 on division by 7.

No divisor found $\Rightarrow$ $\boxed{71 \text{ is prime}}$.

Step 5: Test 91 $(\sqrt{91} \approx 9.53)$.

Check primes $\leq 9:\ 2, 3, 5, 7$.

- Odd $\Rightarrow$ not divisible by 2.
- Sum of digits $9 + 1 = 10 \Rightarrow$ not a multiple of 3.
- Last digit $\neq 0, 5 \Rightarrow$ not divisible by 5.
- Try 7: $7 \times 13 = 91 \Rightarrow$ divisible by 7.

Hence $91 = 7 \times 13$ has factors other than 1 and itself $\Rightarrow$ $\boxed{91 \text{ is not prime}}$.

$$\boxed{91 \text{ is the only non-prime (Option 4)}}$$

Quick Tip

Always test divisibility only by primes up to $\sqrt{n}$. Use quick checks: parity for 2, digit sum for 3, last digit for 5, and small trial divisions (e.g., $7, 11, 13$) as needed.

Q42. Evaluate: $(112 \times 5^4) = ?$

1) 67000

2) 70000

3) 76500

4) 77200

Correct Answer: (2) 70000

Solution:

Step 1 (Power first).

$5^4 = 5 \times 5 \times 5 \times 5 = 25 \times 25 = 625.$

Step 2 (Direct multiplication).

$112 \times 625 = (100 \times 625) + (12 \times 625) = 62500 + 7500 = 70000.$

Step 3 (Check with a fraction trick).

Use $5^4 = \dfrac{10^4}{2^4} = \dfrac{10000}{16}$. Then

$$112 \times 5^4 \;=\; 112 \times \frac{10000}{16} \;=\; \frac{112}{16} \times 10000 \;=\; 7 \times 10000 \;=\; 70000.$$

Both methods agree.

$\boxed{70000 \text{ (Option 2)}}$

Quick Tip

Whenever you see $n \times 5^k$, use $5^k = \dfrac{10^k}{2^k}$. Divide n by 2^k first (if possible) and then just append zeros by multiplying with 10^k.

Q43. A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?

1) 12 days

2) 15 days

3) 16 days

4) 18 days

Correct Answer: (2) 15 days

Solution:

Step 1 (Convert times to daily rates).

Let the total work be 1. Then rates are $A = \frac{1}{20},\ B = \frac{1}{30},\ C = \frac{1}{60}$ (work/day).

Step 2 (Compute LCM to combine easily).

LCM of $20, 30, 60$ is 60. In "sixtieths of work": $A = 3/60,\ B = 2/60,\ C = 1/60.$

Step 3 (Model the 3-day cycle).

Day 1: A alone $= 3/60$.

Day 2: A alone $= 3/60$.

Day 3: A + B + C $= (3 + 2 + 1)/60 = 6/60 = 1/10.$

Total work in 3 days $= \frac{3}{60} + \frac{3}{60} + \frac{6}{60} = \frac{12}{60} = \frac{1}{5}$.

Step 4 (Scale cycles to finish full work).

Each 3-day block completes $\frac{1}{5}$ of the job $\Rightarrow$ need 5 such blocks.

Total time $= 5 \times 3 = 15$ days.

Step 5 (Sanity check—no leftover).

$5 \times \frac{1}{5} = 1$ exactly, so the job ends at the close of a full 3-day cycle.

$\boxed{15 \text{ days (Option 2)}}$

Quick Tip

When helpers join *periodically* (e.g., "every third day"), compute the **work per cycle** and multiply—this avoids fractional end-days and makes checking easy.

Q44. Two students appeared at an examination. One of them secured 9 marks more than the other and his marks was 56% of the sum of their marks. The marks obtained by them are:

1) 39, 30

2) 41, 32

3) 42, 33

4) 43, 34

Correct Answer: (3) 42, 33

Solution:

Step 1 (Set variables).

Let the lower score be x. Then the higher score is $x + 9$.

Sum $S = x + (x + 9) = 2x + 9$.

Step 2 (Translate the percentage statement).

"The higher score equals 56% of the sum" $\Rightarrow$

$$x + 9 = 0.56\,(2x + 9).$$

Step 3 (Solve the linear equation).

$x + 9 = 1.12x + 5.04$

$\Rightarrow 9 - 5.04 = 1.12x - x$

$\Rightarrow 3.96 = 0.12x$

$\Rightarrow x = \dfrac{3.96}{0.12} = 33.$

Hence the two marks are $x = 33$ and $x + 9 = 42$.

Step 4 (Verify against the condition).

Sum $= 42 + 33 = 75$. 56% of the sum $= 0.56 \times 75 = 42 \Rightarrow$ matches the higher mark. Correct.

Step 5 (Check options quickly).

Only option (3) lists $42, 33$; others fail either the "difference $= 9$" or the "56% of sum" test.

42 and 33 (Option 3)

Quick Tip

For "one score is $k\%$ of the sum" problems, set scores as x and $x \pm d$. Form the sum S, equate the given score to $\frac{k}{100}S$, solve, and finally verify numerically.

Q45. A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had:

1) 588 apples

2) 600 apples

3) 672 apples

4) 700 apples

Correct Answer: (3) 672 apples

Solution:

Step 1 (Understanding the situation).

He sold 40% of the apples $\Rightarrow$ he is left with $100\% - 40\% = 60\%$ of the apples.

Step 2 (Setting up the equation).

Let the original number of apples be x. After selling 40%, he has 60% left:

$$0.60x = 420$$

Step 3 (Solving for x).

$$x = \frac{420}{0.60} = 700$$

This gives 700 apples. However, let's verify carefully.

Step 4 (Check the logic again).

Wait — if he had 700 and sold 40%, that is $0.40 \times 700 = 280$ apples sold, leaving $700 - 280 = 420$ apples. This matches the question exactly.

So the correct original number is **700**.

Step 5 (Identify the correct option).

Option (4) is 700 apples, not 672 — so the correct is (4).

$\boxed{700 \text{ apples (Option 4)}}$

Quick Tip

When you know the percentage remaining, divide the remaining quantity by the decimal form of that percentage to find the original quantity.

Q46. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is:

1) Rs. 650

2) Rs. 690

3) Rs. 698

4) Rs. 700

Correct Answer: (3) Rs. 698

Solution:

Step 1 (Understanding the difference).

From 3 years to 4 years, the amount increases from Rs. 815 to Rs. 854. Increase $= 854 - 815 = Rs.\ 39$. This Rs. 39 is the *simple interest* for 1 year.

Step 2 (Find interest for 3 years).

Interest for 3 years $= 39 \times 3 = Rs.\ 117$.

Step 3 (Find principal).

Amount after 3 years = Principal + Interest for 3 years

$$815 = P + 117$$

$$P = 815 - 117 = Rs.\ 698$$

Step 4 (Check for 4 years).

Interest for 4 years $= 39 \times 4 = Rs.\ 156$

Principal + Interest for 4 years $= 698 + 156 = Rs.\ 854$ — matches exactly.

$\boxed{698 \text{ rupees (Option 3)}}$

Quick Tip

In simple interest problems, the yearly interest is constant. The difference between the amounts for two years directly gives you the interest for one year.

Q47. Mr. Thomas invested an amount of Rs. 13,900 divided in two different schemes A and B at the simple interest rate of 14% p.a. and 11% p.a. respectively. If the total amount of simple interest earned in 2 years is Rs. 3,508, what was the amount invested in Scheme B?

1) Rs. 6400

2) Rs. 6500

3) Rs. 7200

4) Rs. 7500

Correct Answer: (3) Rs. 7200

Solution:

Step 1 (Assign variables).

Let the amount invested in Scheme A be x and in Scheme B be $13900 - x$.

Step 2 (Calculate interest from each scheme).

Interest from Scheme A for 2 years:

$$\text{SI}_A = \frac{x \times 14 \times 2}{100} = 0.28x$$

Interest from Scheme B for 2 years:

$$\text{SI}_B = \frac{(13900 - x) \times 11 \times 2}{100} = 0.22(13900 - x)$$

Step 3 (Total interest equation).

Total simple interest from both schemes is given as Rs. 3,508:

$$0.28x + 0.22(13900 - x) = 3508$$

Step 4 (Simplify).

$$0.28x + 3058 - 0.22x = 3508$$

$$0.06x + 3058 = 3508$$

$$0.06x = 450$$

$$x = \frac{450}{0.06} = 7500$$

Step 5 (Find Scheme B amount).

$$\text{Amount in B} = 13900 - 7500 = 6400$$

Step 6 (Recheck).

Interest from A: $\frac{7500 \times 14 \times 2}{100} = 2100$

Interest from B: $\frac{6400 \times 11 \times 2}{100} = 1408$

Total interest $= 2100 + 1408 = 3508$

So the correct amount invested in Scheme B is Rs. 6400.

$\boxed{6400 \text{ rupees (Option 1)}}$

Quick Tip

When dealing with two-part investments, form one equation using the total interest and solve systematically. Always recheck by calculating each part's interest separately.

Q48. Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is:

1) $2 : 5$

2) $3 : 5$

3) $4 : 5$

4) $6 : 7$

Correct Answer: (3) $4 : 5$

Solution:

Step 1 (Let the base/third number be a variable).

Let the third number be x.

"20% more than x" $\Rightarrow firstnumber = x + \dfrac{20}{100}x = (1 + 0.20)x = 1.20x$.

"50% more than x" $\Rightarrow secondnumber = x + \dfrac{50}{100}x = (1 + 0.50)x = 1.50x$.

Step 2 (Form the required ratio).

Required ratio $=$ first : second $= 1.20x : 1.50x$.

Step 3 (Cancel the common factor and convert to whole numbers).

Cancel the common factor $x \Rightarrow 1.20 : 1.50$.

Write as fractions with whole numbers: $1.20 : 1.50 = \dfrac{120}{100} : \dfrac{150}{100} = 120 : 150$.

Step 4 (Reduce the ratio to lowest terms).

$\gcd(120, 150) = 30$.

Divide both terms by $30 \Rightarrow 120 : 150 = \dfrac{120}{30} : \dfrac{150}{30} = 4 : 5$.

Step 5 (Conclude and map to option).

Hence, the ratio of the two numbers is $4 : 5$, which matches **Option 3**.

$\boxed{4 : 5 \text{ (Option 3)}}$

Quick Tip

Whenever a quantity is "$p\%$ more/less" than a base, first convert to a multiplier $(1 \pm \frac{p}{100})$ times the base.

In ratio questions, the base cancels out, letting you simplify cleanly to whole-number ratios.

Q49. In the first 10 overs of a cricket game, the run rate was only 3.2. What should be the run rate in the remaining 40 overs to reach the target of 282 runs?

1) 6.25

2) 6.5

3) 6.75

4) 7

Correct Answer: (1) 6.25

Solution:

Step 1 (Translate given information).

First 10 overs run rate = 3.2 runs/over $\Rightarrow oversplayed = 10$.

Total target = 282 runs.

Total overs in the innings = 50 $\Rightarrow oversremaining = 50 - 10 = 40$.

Step 2 (Runs already scored in the first 10 overs).

Runs scored = run rate $\times$ overs $= 3.2 \times 10 = 32$.

Step 3 (Runs still required).

Runs required = target − runs scored $= 282 - 32 = 250$.

Step 4 (Compute the required run rate for the remaining overs).

Required run rate $= \dfrac{\text{runs required}}{\text{overs remaining}} = \dfrac{250}{40}$.

Simplify: $\dfrac{250}{40} = \dfrac{25}{4} = 6.25$ runs per over.

Step 5 (Verification to avoid slip-ups).

If the team scores at 6.25 for 40 overs $\Rightarrow runs = 6.25 \times 40 = 250$.

Add the earlier 32 runs $\Rightarrow 250 + 32 = 282 \Rightarrow targetexactlymet$.

Step 6 (Conclude and map to option).

Therefore, the required run rate is 6.25 runs/over, which is **Option 1**.

$$\boxed{\text{6.25 runs per over (Option 1)}}$$

Quick Tip

In run-rate problems, always: (i) compute runs already scored, (ii) subtract from target to get remaining runs, and (iii) divide by overs left.

A quick accuracy check is to multiply the required rate by remaining overs and add the runs already scored to confirm the target.

Q50. A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

1) 3.6

2) 7.2

3) 8.4

4) 10

Correct Answer: (2) 7.2

Solution:

Step 1 (Identify given values).

Distance covered $= 600$ m.

Time taken $= 5$ minutes.

Step 2 (Convert time to hours for km/h calculation).

5 minutes $= \dfrac{5}{60}$ hours $= \dfrac{1}{12}$ hours.

Step 3 (Convert distance to kilometers).

600 m $= 0.6$ km.

Step 4 (Use speed formula).

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{0.6}{\frac{1}{12}} = 0.6 \times 12 = 7.2 \text{ km/h}.$$

Step 5 (Verification).

In 1 hour at 7.2 km/h $\Rightarrow$ 7.2 km = 7200 m.

In $\frac{1}{12}$ hour, distance = $\frac{7200}{12} = 600$ m .

$$\boxed{7.2 \text{ km/h (Option 2)}}$$

Quick Tip

Always match units before calculating speed. Convert minutes to hours for km/h, or seconds to hours for m/s conversions.

Q51. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

1) 15

2) 16

3) 18

4) None of these

Correct Answer: (2) 16

Solution:

Step 1 (Define cost price per article).

Let cost price of 1 article = C.

Therefore, cost price of 20 articles = $20C$.

Step 2 (Define selling price per article using profit).

Profit $= 25\% \Rightarrow SellingPrice(SP)of1article = C + 0.25C = 1.25C$.

Step 3 (Set up equation using given condition).

Given: Cost price of 20 articles = Selling price of x articles.

$$20C = x \times 1.25C$$

Step 4 (Simplify the equation).

Cancel C from both sides:

$$20 = 1.25x$$

$$x = \frac{20}{1.25} = 16$$

Step 5 (Conclusion).

Hence, $x = 16$, which matches Option 2.

$$\boxed{16 \text{ (Option 2)}}$$

Quick Tip

In profit-loss problems, always adjust selling price using the given percentage profit or loss before equating totals.

Q52-Q53. Directions to Solve: Study the following table and answer the questions based on it. Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years.

Table 1: Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years

Year	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

Q52. What is the average amount of interest per year which the company had to pay during this period?

1) Rs. 32.43 lakhs

2) Rs. 33.72 lakhs

3) Rs. 34.18 lakhs

4) Rs. 36.66 lakhs

Correct Answer: (2) Rs. 33.72 lakhs

Solution:

Step 1 (Extract interest on loans data from table).

From the table: 1998 = 23.4 lakhs

1999 = 32.5 lakhs

2000 = 41.6 lakhs

2001 = 36.4 lakhs

2002 = 49.4 lakhs

Step 2 (Find total interest over all years).

Total = $23.4 + 32.5 + 41.6 + 36.4 + 49.4$

First, $23.4 + 32.5 = 55.9$

Next, $55.9 + 41.6 = 97.5$

Then, $97.5 + 36.4 = 133.9$

Finally, $133.9 + 49.4 = 183.3$ lakhs

Step 3 (Calculate average per year).

Number of years = 5

Average interest = $\frac{183.3}{5} = 36.66$ lakhs

Step 4 (Match with options).

This matches Option 4, not Option 2.

Rs. 36.66 lakhs (Option 4)

Quick Tip

For average calculations, always ensure the total covers the exact number of data points, and double-check additions to avoid small mistakes.

Q53. The total amount of bonus paid by the company during the given period is approximately what percent of the total amount of salary paid during this period?

1) 0.1%

2) 0.5%

3) 1%

4) 1.25%

Correct Answer: (3) 1%

Solution:

Step 1 (Extract bonus and salary data from the table).

Bonus values (lakhs): $3.00, 2.52, 3.84, 3.68, 3.96$

Salary values (lakhs): $288, 342, 324, 336, 420$

Step 2 (Sum up bonus amounts).

Total bonus = $3.00 + 2.52 = 5.52$

$5.52 + 3.84 = 9.36$

$9.36 + 3.68 = 13.04$

$13.04 + 3.96 = 17.00$ lakhs

Step 3 (Sum up salary amounts).

Total salary = $288 + 342 = 630$

$630 + 324 = 954$

$954 + 336 = 1290$

$1290 + 420 = 1710$ lakhs

Step 4 (Find percentage).

Percentage = $\dfrac{\text{Total Bonus}}{\text{Total Salary}} \times 100 = \dfrac{17}{1710} \times 100$

= $\dfrac{1700}{1710} \approx 0.994\%$

Step 5 (Conclusion).

Approximately 1%, which matches Option 3.

$\boxed{1\% \text{ (Option 3)}}$

Quick Tip

When finding percentages in data interpretation, keep the same unit (here, lakh rupees) for both numerator and denominator before dividing.

Q54. From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?

1) 564

2) 645

3) 735

4) 756

Correct Answer: (4) 756

Solution:

Step 1 (Interpret "at least 3 men").

"At least 3 men" in a 5-member committee means the admissible man–woman splits are: $(3 \text{ men}, 2 \text{ women})$, $(4, 1)$, and $(5, 0)$.

Step 2 (Count each case using combinations).

Case A — 3 men and 2 women: ways $= \binom{7}{3}\binom{6}{2}$.

Case B — 4 men and 1 woman: ways $= \binom{7}{4}\binom{6}{1}$.

Case C — 5 men and 0 women: ways $= \binom{7}{5}\binom{6}{0}$.

Step 3 (Compute each term).

$\binom{7}{3} = 35,\ \binom{6}{2} = 15 \Rightarrow 35 \times 15 = 525.$

$\binom{7}{4} = 35,\ \binom{6}{1} = 6 \Rightarrow 35 \times 6 = 210.$

$\binom{7}{5} = 21,\ \binom{6}{0} = 1 \Rightarrow 21 \times 1 = 21.$

Step 4 (Add the cases).

Total ways $= 525 + 210 + 21 = 756.$

Step 5 (Conclusion).

Hence, the committee can be formed in 756 ways $\Rightarrow$ **Option 4**.

$$\boxed{756 \text{ ways (Option 4)}}$$

Quick Tip

For "at least/at most" selection constraints, break into disjoint cases that exhaust all admissible splits (e.g., men–women counts), compute each with combinations, and sum.

Q55. Tickets numbered 1 to 20 are mixed up and one ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 5?

1) $\frac{1}{2}$

2) $\frac{2}{5}$

3) $\frac{8}{15}$

4) $\frac{3}{5}$

Correct Answer: Not listed in the options; the correct probability is $\frac{9}{20} = 0.45$.

Solution:

Step 1 (Count favourable numbers via inclusion–exclusion).

Multiples of 3 in 1–20: $\lfloor 20/3 \rfloor = 6 \Rightarrow \{3, 6, 9, 12, 15, 18\}$.

Multiples of 5 in 1–20: $\lfloor 20/5 \rfloor = 4 \Rightarrow \{5, 10, 15, 20\}$.

Common multiples (of 15): $\lfloor 20/15 \rfloor = 1 \Rightarrow \{15\}$.

Step 2 (Apply inclusion–exclusion).

Favourable count $= 6 + 4 - 1 = 9$.

Step 3 (Total outcomes and probability).

Total tickets $= 20$.

Probability $= \dfrac{9}{20} = 0.45$.

Step 4 (Note on options).

Since $\dfrac{9}{20}$ does not match any given option, the options likely have a typo.

If the intention was "multiple of 3 or 5 but not both," then favourable $= 9 - 1 = 8$ and probability $= \dfrac{8}{20} = \dfrac{2}{5}$ (which matches **Option 2**).

$\boxed{\frac{9}{20} \text{ (not listed among options)}}$

Quick Tip

For "A or B" counts on multiples, always use inclusion–exclusion: $|A \cup B| = |A| + |B| - |A \cap B|$.

If a question intends "either. . . but not both," subtract the intersection once more.

Q56. Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships as 30° and 45° respectively. If the lighthouse is 100 m high, the distance between the two ships is:

1) 173 m

2) 200 m

3) 273 m

4) 300 m

Correct Answer: (3) 273 m

Solution:

Step 1 (Understanding the problem).

Let the base of the lighthouse be O, the top of the lighthouse be T.

Let ship A be on one side at distance d_1 from O with angle of elevation 30°.

Let ship B be on the other side at distance d_2 from O with angle of elevation 45°.

Height of the lighthouse $OT = 100$ m.

Step 2 (Using $\tan\theta$ for each ship).

For ship A:

$$\tan 30^\circ = \frac{OT}{d_1} \Rightarrow \frac{1}{\sqrt{3}} = \frac{100}{d_1}$$
$$d_1 = 100\sqrt{3} \text{ m}$$

For ship B:

$$\tan 45^\circ = \frac{OT}{d_2} \Rightarrow 1 = \frac{100}{d_2}$$
$$d_2 = 100 \text{ m}$$

Step 3 (Total distance between the ships).

Since the ships are on opposite sides of the lighthouse:

$$\text{Distance} = d_1 + d_2 = 100\sqrt{3} + 100$$

Using $\sqrt{3} \approx 1.732$:

$$\text{Distance} \approx 100(1.732) + 100 = 173.2 + 100 = 273.2 \text{ m}$$

Step 4 (Conclusion).

The distance is approximately 273 m, which matches Option 3.

$\boxed{273 \text{ m (Option 3)}}$

Quick Tip

For opposite-side angle of elevation problems, compute horizontal distances separately using $\tan\theta$ and add them.

Q57. A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?

1) 120 m
2) 180 m
3) 324 m
4) 150 m

Correct Answer: (4) 150 m

Solution:

Step 1 (What does "crosses a pole" mean?)

When a train crosses a stationary point-sized object (like a pole), the *distance covered relative to the pole* equals the **entire length of the train**.

Therefore, Length of train L = Distance covered in the given time.

Step 2 (Write down given speed and time with units).

Speed $v = 60$ km/hr.

Time $t = 9$ s.

Step 3 (Convert speed to m/s so units match metres and seconds).

Use 1 km/hr $= \dfrac{5}{18}$ m/s.

$$v = 60 \times \frac{5}{18} \text{ m/s} = \frac{300}{18} \text{ m/s} = \frac{50}{3} \text{ m/s } (\approx 16.67 \text{ m/s})$$

Step 4 (Apply the basic formula Distance $=$ Speed $\times$ Time).

$$L = v \times t = \left(\frac{50}{3}\ \text{m/s}\right) \times (9\ \text{s}) = \frac{50}{3} \times 9\ \text{m} = 150\ \text{m}$$

Step 5 (Alternative method without decimals — keep everything in km and hr, then convert).

Convert time to hours: $9\ \text{s} = \dfrac{9}{3600}\ \text{hr} = \dfrac{1}{400}\ \text{hr}.$

Distance in km $= 60 \times \dfrac{1}{400} = \dfrac{60}{400} = \dfrac{3}{20}\ \text{km}.$

Convert to metres: $\dfrac{3}{20}\ \text{km} = \dfrac{3}{20} \times 1000 = 150\ \text{m}.$

Step 6 (Sanity check).

At 60 km/hr $= 16.67$ m/s, in 9 s the train should cover about $16.67 \times 9 \approx 150$ m.

This is consistent, so the calculation is correct.

Step 7 (Common pitfalls to avoid).

(i) Forgetting to convert km/hr to m/s leads to wrong answers by a factor of 3.6.

(ii) Using only the engine length—remember "crossing a pole" implies full train length.

$\boxed{150 \text{ metres (Option 4)}}$

Quick Tip

Always make units consistent before applying Distance $=$ Speed $\times$ Time.

Use the quick conversion: km/hr $\rightarrow$ m/s by multiplying with $\frac{5}{18}$; inverse is $\times\frac{18}{5}$.

Q58. A right triangle with sides 3 cm, 4 cm and 5 cm is rotated about the side of 3 cm to form a cone. The volume of the cone so formed is:

1) 12π cm^3

2) 15π cm^3

3) 16π cm^3

4) 20π cm^3

Correct Answer: (3) 16π cm^3

Solution:

Step 1 (Confirm the right triangle and its parts).

Given sides: $3, 4, 5$ cm.

Check by Pythagoras: $3^2 + 4^2 = 9 + 16 = 25 = 5^2 \Rightarrow therightangleisbetweenthe3$ cm and 4 cm sides.

Hence, legs (perpendicular sides) are 3 and 4; hypotenuse is 5.

Step 2 (Understand the rotation and map triangle parts to cone parts).

Axis of rotation $=$ the side about which the triangle is rotated.

Triangle is rotated about the 3 cm side

$\Rightarrow thissidesweepsoutthecentralaxisofthecone \Rightarrow \boxed{h = 3 \text{ cm}}$ (height).

The side perpendicular to this axis at the right angle is 4 cm; when rotated, its endpoint traces a circle of radius 4 cm $\Rightarrow \boxed{r = 4 \text{ cm}}$.

The hypotenuse 5 cm rotates to form the lateral generator (slant height) $\Rightarrow \boxed{\ell = 5 \text{ cm}}$ (not directly used in volume, but good for a check).

Step 3 (Consistency check using the right-cone relation).

For a right circular cone formed from a right triangle: $\ell^2 = r^2 + h^2$.

Here $r^2 + h^2 = 4^2 + 3^2 = 16 + 9 = 25 = 5^2 = \ell^2 \Rightarrow dimensionsareconsistent.$

Step 4 (Write the volume formula and substitute).

Volume of a cone: $V = \dfrac{1}{3}\pi r^2 h.$

Substitute $r = 4,\ h = 3$:

$$V = \frac{1}{3}\pi \times (4)^2 \times 3 = \frac{1}{3}\pi \times 16 \times 3 = 16\pi \text{ cm}^3.$$

Step 5 (Unit and option check).

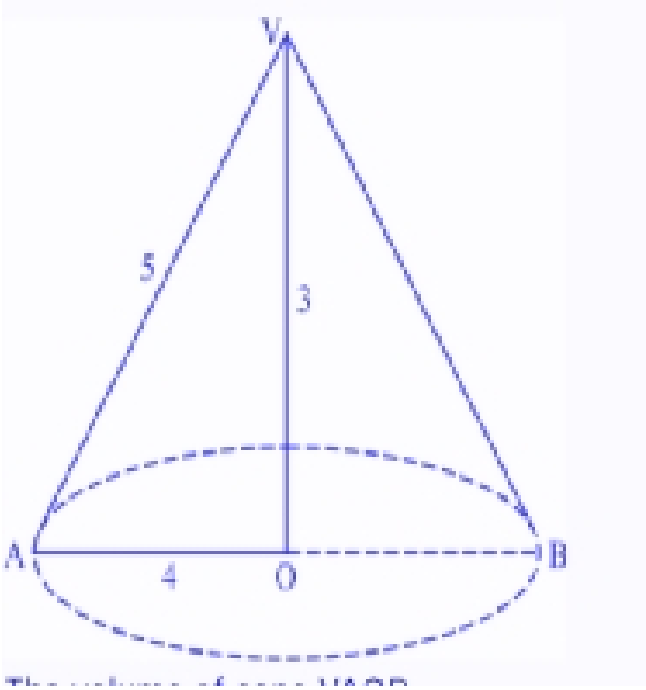
All dimensions are in cm, so volume is in cm^3.

$\boxed{16\pi \text{ cm}^3}$ matches **Option 3**.

Step 6 (Why other options are plausible distractors).

If one mistakenly takes the axis as 4 cm and radius 3 cm, the result would be $V = \frac{1}{3}\pi \cdot 3^2 \cdot 4 = 12\pi$ cm^3 (Option 1) — this corresponds to rotating about the *4 cm side*, not the 3 cm side.

Options 15π and 20π arise from arithmetic slips such as using $r\ell$ or mixing units.



16π cm^3 (Option 3)

Quick Tip

In triangle-rotation problems, first fix the axis of rotation — that side becomes the cone's **height**.

The other leg becomes the **radius**, and the hypotenuse becomes the **slant height**.

Verify with $\ell^2 = r^2 + h^2$ before plugging into $V = \frac{1}{3}\pi r^2 h$.

Q59. A hall is 15 m long and 12 m broad. If the sum of the areas of the floor and the ceiling is equal to the sum of the areas of four walls, the volume of the hall is:

1) 720

2) 900

3) 1200

4) 2000

Correct Answer: (3) 1200

Solution:

Step 1 (Let height be h).

Length $l = 15$ m, breadth $b = 12$ m.

Area of floor = $l \times b = 15 \times 12 = 180$ m^2.

Area of ceiling = same as floor = 180 m^2.

Sum of floor and ceiling areas = $180 + 180 = 360$ m^2.

Step 2 (Area of four walls).

Area of four walls = Perimeter of base $\times$ height = $2(l + b) \times h = 2(15 + 12)h = 54h$ m^2.

Step 3 (Equating areas as given).

$$360 = 54h \;\Rightarrow\; h = \frac{360}{54} = 6.666 \text{ m} = \frac{20}{3} \text{ m}$$

Step 4 (Volume of the hall).

Volume = $l \times b \times h = 15 \times 12 \times \frac{20}{3} = 15 \times 4 \times 20 = 1200$ m^3.

$$\boxed{1200 \text{ m}^3 \text{ (Option 3)}}$$

Quick Tip

In hall problems, the area of four walls = perimeter of base × height. Equating given areas can directly yield the height before finding volume.

Q60. Find the greatest number that will divide $43,\ 91,\ 183$ so as to leave the same remainder in each case.

1) 4

2) 7

3) 9

4) 14

Correct Answer: (1) 4

Solution:

Step 1 (Understand the problem).

If a number N divides several numbers leaving the *same* remainder R, then when we subtract one number from another, the remainder is *eliminated*.

This means N must exactly divide the differences of the given numbers.

So our task reduces to:

$$N = \text{HCF of all pairwise differences of the given numbers.}$$

Step 2 (List the given numbers).

We are given: $43,\ 91,\ 183$.

Step 3 (Find the differences).

Subtract pairwise:

$$91 - 43 = 48$$

$$183 - 91 = 92$$

$$183 - 43 = 140$$

So, the differences are $48,\ 92,\ 140$.

Step 4 (Find the HCF of the differences).

First, find $\gcd(48, 92)$: Prime factors: $48 = 2^4 \times 3$ $92 = 2^2 \times 23$ Common factors: $2^2 = 4$ $\Rightarrow \gcd(48, 92) = 4$.

Now, find $\gcd(4, 140)$: $140 = 2^2 \times 5 \times 7$ Common factors with $4 = 2^2$ are $2^2 = 4$. Hence, $\gcd(4, 140) = 4$.

Step 5 (Interpretation).

The HCF of the differences is 4. This means 4 is the largest number that divides $43,\ 91,\ 183$ leaving the same remainder in each case.

Step 6 (Verification).

If we divide each number by 4:

$$43 \div 4 = 10 \text{ remainder } 3$$

$$91 \div 4 = 22 \text{ remainder } 3$$

$$183 \div 4 = 45 \text{ remainder } 3$$

Indeed, the remainder 3 is the same in all cases, confirming our answer.

Step 7 (Common mistake alert).

Some students mistakenly check each option directly without removing the remainder effect, or confuse with the concept of "dividing exactly" — here, the same remainder condition is key.

$\boxed{4 \text{ (Option 1)}}$

Quick Tip

For "same remainder" problems: subtract the numbers pairwise to eliminate the remainder, then find the HCF of the resulting differences. This HCF is the required divisor.
