KMAT Logical Reasoning

Sample Paper – 4

Duration: 40 Minutes **Maximum Marks: 40**

Instructions

- This paper contains **40** Multiple Choice Questions (Single Correct Answer), modelled on the Logical Reasoning section of the **KMAT Karnataka** entrance examination.
- Each correct answer carries **+1 mark**. There is **no negative marking** for incorrect or unattempted answers.
- Only **one** option is correct per question. Choose carefully.
- Syllabus: Series, Analogy, Classification, Coding-Decoding, Blood Relations, Directions, Seating Arrangement, Syllogisms, Statements & Conclusions, Venn Diagrams, Ranking, and Data Sufficiency.
- Use of mobile phones, calculators, or other electronic gadgets is strictly prohibited.

Q1. Find the missing term in the series: 2, 3, 5, 8, 13, ____

(A) 21

(B) 18

(C) 20

(D) 24

Q2. Find the missing term in the series: B, D, H, N, V, ____

(A) D

(B) E

(C) F

(D) G

Q3. Find the missing term in the series: P2, N4, L8, J16, ____

(A) G32

(B) H32

(C) I32

(D) H16

Q4. Choose the correct analogy: 25 : 5 :: 49 : ____

(A) 6

(B) 14

(C) 35

(D) 7

Q5. Choose the correct analogy: **Marathon** is to **Running** as **Regatta** is to ____

(A) Sailing

(B) Swimming

(C) Cycling

(D) Rowing

Q6. Choose the correct analogy: ABCD : ZABC :: EFGH : ____

(A) CDEF

(B) DEGI

(C) DEFG

(D) EFGH

Q7. In the following list of numbers, find the **odd one out**: 6, 12, 20, 30, 42, 52

(A) 6

(B) 52

(C) 30

(D) 42

Q8. Which of the following is **NOT** a programming language?

(A) Python

(B) Java

(C) C++

(D) HTML

Q9. In a certain code, KITE is written as NLWH. Using the same coding rule, how is BIRD written?

(A) ELUG

(B) EMUG

(C) EKUG

(D) ELUH

Q10. If DOG = 26, then CAT = ?

(Each letter is coded by its position in the alphabet; the value of a word is the sum of its letters' positions.)

(A) 23

(B) 25

(C) 24

(D) 27

Q11. If SUN = 54, then MOON = ?

(Each letter is coded by its position in the alphabet; the value of a word is the sum of its letters' positions.)

(A) 54

(B) 55

(C) 56

(D) 57

Q12. Study the coded sentences below and answer the question.

'mi tu se' = 'I go home'
'tu de ra' = 'go come back'
'mi de si' = 'I come fast'

What is the code for the word **'I'**?

(A) tu

(B) mi

(C) de

(D) se

Q13. In a family: P is Q's father. R is Q's sister. S is P's father. T is S's wife.

How is **T** related to **Q**?

(A) Grandmother

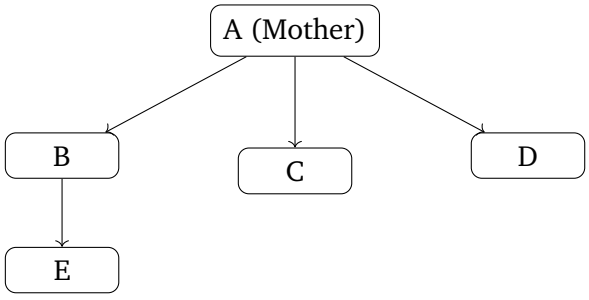
(B) Mother

(C) Aunt

(D) Great-grandmother

Q14. Study the family tree below and answer the question.

A is the mother of B. C is the son of A. D is the brother of C. E is the daughter of B.



How is **E** related to **D**?

(A) Daughter

(B) Sister

(C) Niece

(D) Granddaughter

Q15. Decode the symbolic family relation:

A + B = A is father of B **A × B** = A is mother of B

A − B = A is sister of B **A ÷ B** = A is brother of B

Expression: $P \times Q + R \div S - T$

How is **P** related to **T**?

(A) Mother

(B) Sister

(C) Aunt

(D) Grandmother

Q16. Sam initially faces **North**. He then turns **90° clockwise**, followed by **180° anticlockwise**, and then **90° clockwise**.

In which direction does Sam now face?

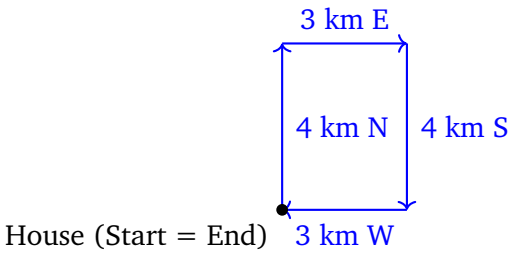
(A) South

(B) North

(C) East

(D) West

Q17. A boy starts from his house and walks **4 km North**, then **3 km East**, then **4 km South**, then **3 km West**.



How far is he from his house?

(A) 0 km

(B) 4 km

(C) 14 km

(D) 3 km

Q18. In a certain country, directions have been renamed as follows:

West is called North, North is called East, East is called South, South is called West.

In which of these renamed directions does the **sun rise**?

(A) North

(B) East

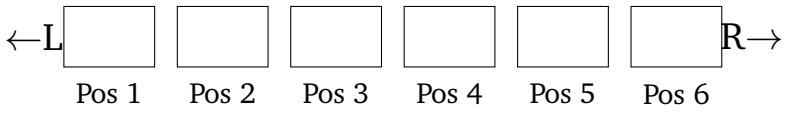
(C) South

(D) West

Q19. **Questions 19–22** are based on the following arrangement.

Six friends **O, J, K, M, N, L** sit in a row facing the same direction (positions 1 to 6, left to right):

- J sits at the 2nd position from the left.
- K is immediately to the right of J.
- L sits at the extreme right.
- M is immediately to the left of N.
- O sits at the extreme left.
- N and K are **not** adjacent.



Who sits **immediately to the right** of K?

(A) J

(B) N

(C) O

(D) M

Q20. Referring to the same seating arrangement (Q19–22):

How many persons sit **between O and N**?

(A) 2

(B) 3

(C) 4

(D) 1

Q21. Referring to the same seating arrangement (Q19–22):

Who sits **3rd from the right end**?

(A) M

(B) K

(C) N

(D) J

Q22. Referring to the same seating arrangement (Q19–22):

Which pair of friends sits at the **two extreme ends** of the row?

(A) J and L

(B) O and N

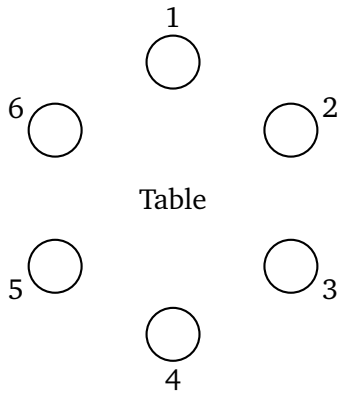
(C) O and L

(D) K and L

Q23. **Questions 23–25** are based on the following arrangement.

Six people **P, Q, S, T, R, U** sit around a **circular table**, all facing the centre.

- P and T sit directly opposite each other.
- Q is immediately to the right of P (clockwise).
- R sits directly opposite Q.
- S is immediately to the right of Q (clockwise).
- U occupies the remaining seat.



Who sits **directly opposite** to S?

(A) T

(B) R

(C) Q

(D) U

Q24. Referring to the same circular arrangement (Q23–25):

Who are the **immediate neighbours** of T?

(A) P and Q

(B) S and R

(C) Q and S

(D) R and U

Q25. Referring to the same circular arrangement (Q23–25):

How many persons sit between **P and R** going **clockwise from P**?

(A) 3

(B) 2

(C) 1

(D) 4

Q26. Statements:

i. All computers are machines.
ii. All machines need power.

Conclusions:

I. All computers need power.
II. Some things that need power are machines.

Which conclusion(s) follow(s)?

(A) Only I follows

(B) Only II follows

(C) Both I and II follow

(D) Neither follows

Q27. Statements:

i. Some rivers are deep.
ii. Some deep things are dangerous.

Conclusions:

I. Some rivers are dangerous.
II. All dangerous things are rivers.

Which conclusion(s) follow(s)?

(A) Only I follows

(B) Only II follows

(C) Both I and II follow

(D) Neither follows

Q28. Statements:

i. No cat is a dog.
ii. All dogs are loyal.

Conclusions:

I. No cat is loyal.
II. Some loyal animals are not cats.

Which conclusion(s) follow(s)?

(A) Only I follows
(B) Only II follows
(C) Both I and II follow
(D) Neither follows

Q29. Statements:

i. All tigers are mammals.
ii. Simba is a tiger.

Conclusions:

I. Simba is a mammal.
II. All mammals are tigers.

Which conclusion(s) follow(s)?

(A) Only I follows
(B) Only II follows
(C) Both I and II follow
(D) Neither follows

Q30. Statement: "All employees who work overtime will receive extra pay."

Assumptions:

I. The company has a policy for overtime compensation.
II. Employees are capable of working overtime.

Which assumption(s) is/are **implicit** in the statement?

(A) Only I is implicit
(B) Only II is implicit
(C) Both I and II are implicit
(D) Neither is implicit

Q31. **Statement:** "The teacher told the class: 'Those who complete all assignments will pass the exam.' "

Conclusions:

I. Only students who complete assignments can pass the exam.
II. Completing all assignments is a sufficient guarantee of passing.

Which conclusion(s) follow(s)?

(A) Only I follows
(B) Only II follows
(C) Both follow
(D) Neither follows

Q32. Observe the pattern in the table below and find the missing value.

a	b	$a \blacksquare b$
6	2	32
8	3	55
5	4	21

Find: $9 \blacksquare 3 = ?$

(A) 72

(B) 78

(C) 84

(D) 63

Q33. Arjun is **15th from the left end** and **11th from the right end** in a row of students.

How many students are there in the row?

(A) 25

(B) 26

(C) 24

(D) 27

Q34. Six persons are arranged in **decreasing order of age**: X, Y, Z, W, V, U (from oldest to youngest). Y is 30 years old.

What is **Z's rank** counted from the **oldest**?

(A) 1st

(B) 2nd

(C) 3rd

(D) 4th

Q35. In a queue, Hari is **8th from the front** and **10th from the back**.

How many people are there in the queue?

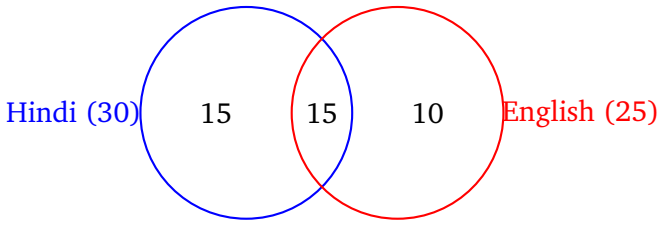
(A) 16

(B) 15

(C) 18

(D) 17

Q36. In a group of 50 students, 30 study **Hindi**, 25 study **English**, and 15 study **both**.



How many students study **only English**?

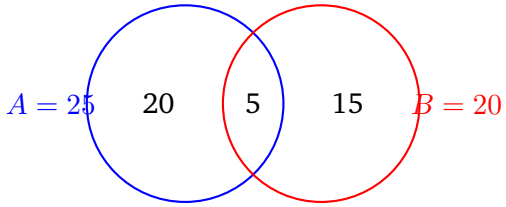
(A) 15

(B) 10

(C) 25

(D) 5

Q37. If $n(A) = 25,\ n(B) = 20,$ and $n(A \cup B) = 40$, find $n(A \cap B)$.



(A) 5

(B) 10

(C) 15

(D) 20

Q38. **Question:** What is the value of $a + b$?

Statement I: $2a - b = 10$

Statement II: $a - 2b = 5$

(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both statements together are sufficient, but neither alone is sufficient

(D) Both statements together are also not sufficient

Q39. **Question:** What is the digit in the **tens place** of a two-digit number?

Statement I: The number is odd.

Statement II: The number is greater than 50.

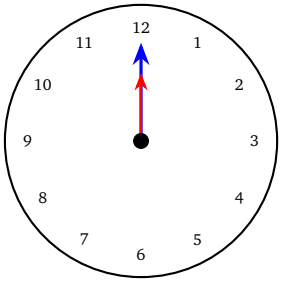
(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both statements together are sufficient

(D) Both statements together are also not sufficient

Q40. How many times in a **day (24 hours)** do the hour hand and minute hand of a clock **coincide**?



Hands coincide at 12:00

(A) 20

(B) 22

(C) 24

(D) 44

Solutions

Q1.

Solution

Concept — Number Series (Fibonacci-type): Each term is the sum of the two immediately preceding terms.

Step 1 — Identify the rule: $2+3=5$, $3+5=8$, $5+8=13$, $8+13=$ **21**.

Why other options are wrong:

- Option B (18): $8+10=18$ assumes a constant difference of 5, which is incorrect.
- Option C (20): No valid Fibonacci-type rule produces 20 here.
- Option D (24): Overshoot; $8+13=21$, not 24.

Final Answer: The missing term is 21. $\Rightarrow$ A

Answer: (A) Go Back to Q 1

Q2.

Solution

Concept — Letter Series (position differences): Write each letter as its alphabet position: B=2, D=4, H=8, N=14, V=22. The differences are $+2, +4, +6, +8, \ldots$ (increasing by 2 each step). The next difference is $+10$, giving position $22+10=32$. Since $32>26$, subtract 26: $32-26=6$, which is **F**.

Step 1 — Differences: $4-2=2,\ 8-4=4,\ 14-8=6,\ 22-14=8$. Next difference $=10$.

Step 2 — Next position $=22+10=32\equiv 32-26=6$ (F).

Why other options are wrong:

- Option A (D=4): Only $+8$ added; misses the incrementing gap.
- Option B (E=5): Position 27, one short of the wrap-around.
- Option D (G=7): Position 33 implies a gap of 11, which is wrong.

Final Answer: The next letter is F. $\Rightarrow$ C

Answer: (C) Go Back to Q 2

Q3.

Solution

Concept — Alpha-numeric Series (dual pattern): Letters decrease by 2 positions each step; numbers double each step.

Step 1 — Letters: P→N→L→J→**H** (each step -2).

Step 2 — Numbers: $2 \to 4 \to 8 \to 16 \to$ **32** (each step $\times 2$).

Why other options are wrong:

- Option A (G32): Letter G is 3 positions after J, not 2.
- Option C (I32): I is only 1 position after J, wrong direction.
- Option D (H16): Number should double to 32, not stay at 16.

Final Answer: The missing term is H32. $\Rightarrow$ B

Answer: (B) Go Back to Q 3

Q4.

Solution

Concept — Number Analogy (square root): The relationship is: first number : square root of first number. $\sqrt{25} = 5$, so $\sqrt{49} =$ **7**.

Step 1 — $25 = 5^2 \Rightarrow 25 : 5$.

Step 2 — $49 = 7^2 \Rightarrow 49 :$ **7**.

Why other options are wrong:

- Option A (6): $6^2 = 36 \neq 49$.
- Option B (14): 14 is $49/3.5$, no logical pattern.
- Option C (35): 35 is $49 - 14$, no consistent rule.

Final Answer: $49 : 7. \Rightarrow$ D

Answer: (D) Go Back to Q 4

Q5.

Solution

Concept — Word Analogy (sport and its event name): A Marathon is the name of an athletic event for Running. A Regatta is the name of a competitive event for Sailing.

Step 1 — Marathon $\rightarrow$ competitive race event $\rightarrow$ sport is Running.

Step 2 — Regatta $\rightarrow$ competitive race event $\rightarrow$ sport is **Sailing**.

Why other options are wrong:

- Option B (Swimming): A swimming competition is called a swim meet, not a regatta.
- Option C (Cycling): A cycling event is called a race or tour, not a regatta.
- Option D (Rowing): Though regattas sometimes include rowing, the primary association is sailing.

Final Answer: Regatta : Sailing. $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q 5

Q6.

Solution

Concept — Letter Analogy (shift each letter one position back): Each letter in the first group is shifted one position backward in the alphabet to form the second group. A$\rightarrow$Z (wrap), B$\rightarrow$A, C$\rightarrow$B, D$\rightarrow$C. Applying the same to EFGH: E$\rightarrow$D, F$\rightarrow$E, G$\rightarrow$F, H$\rightarrow$G gives **DEFG**.

Step 1 — ABCD $\rightarrow$ ZABC (each letter -1, with A wrapping to Z).

Step 2 — EFGH $\rightarrow$ D, E, F, G = **DEFG**.

Why other options are wrong:

- Option A (CDEF): Shift of -2, not -1.
- Option B (DEGI): Non-sequential; skips letters.
- Option D (EFGH): No shift applied.

Final Answer: EFGH $\rightarrow$ DEFG. $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q 6

Q7.

Solution

Concept — Classification / Odd One Out (product of consecutive integers): The pattern is $n(n+1)$: $2 \times 3 = 6$, $3 \times 4 = 12$, $4 \times 5 = 20$, $5 \times 6 = 30$, $6 \times 7 = 42$. The next term should be $7 \times 8 = \mathbf{56}$, but 52 is given.

Step 1 — Series: $n(n+1)$ for $n = 2, 3, 4, 5, 6$: gives $6, 12, 20, 30, 42$.

Step 2 — The 6th term should be $7 \times 8 = 56$. The given value 52 does not fit the pattern.

Why other options are wrong:

- Option A (6): $2 \times 3 = 6$ ✓, fits the pattern.
- Option C (30): $5 \times 6 = 30$ ✓, fits the pattern.
- Option D (42): $6 \times 7 = 42$ ✓, fits the pattern.

Final Answer: 52 is the odd one out (should be 56). $\Rightarrow$ B

Answer: (B) Go Back to Q 7

Q8.

Solution

Concept — Classification (programming vs. markup language): Python, Java, and C++ are general-purpose programming languages used to write algorithms and control program logic. HTML (HyperText Markup Language) is a markup language used to structure content on web pages; it is not a programming language.

Step 1 — Python, Java, C++: all Turing-complete programming languages.

Step 2 — HTML: describes document structure using tags; has no logic, loops, or variables. It is a markup language.

Why other options are wrong:

- Option A (Python): A high-level interpreted programming language.

- Option B (Java): A compiled/interpreted object-oriented programming language.
- Option C (C++): A compiled systems programming language.

Final Answer: HTML is NOT a programming language. $\Rightarrow$ D

Answer: (D) Go Back to Q 8

Q9.

Solution

Concept — Coding-Decoding (letter shift +3): Each letter in the word is shifted 3 positions forward in the alphabet. K→N, I→L, T→W, E→H gives NLWH. Apply the same rule to BIRD: B→E, I→L, R→U, D→G gives **ELUG**.

Step 1 — KITE: K(11)+3=14=N; I(9)+3=12=L; T(20)+3=23=W; E(5)+3=8=H $\Rightarrow$ NLWH.

Step 2 — BIRD: B(2)+3=5=E; I(9)+3=12=L; R(18)+3=21=U; D(4)+3=7=G $\Rightarrow$ **ELUG**.

Why other options are wrong:

- Option B (EMUG): Second letter should be L, not M (I+3=L, not M).
- Option C (EKUG): Second letter should be L; K is I+2, not +3.
- Option D (ELUH): Last letter should be G; H is D+4, not +3.

Final Answer: BIRD is coded as ELUG. $\Rightarrow$ A

Answer: (A) Go Back to Q 9

Q10.

Solution

Concept — Coding-Decoding (sum of letter positions): Each letter's code = its position in the alphabet. The word's value = sum of all letter positions.

Step 1 — Verify: DOG: D=4, O=15, G=7. Sum $= 4 + 15 + 7 = 26$ ✓.

Step 2 — CAT: C=3, A=1, T=20. Sum $= 3 + 1 + 20 =$ **24**.

Why other options are wrong:

- Option A (23): Off by 1; misreads C=2 or A=0.
- Option B (25): Off by 1; likely misreads T=19 (S instead of T).
- Option D (27): Off by 3; overcounts one letter.

Final Answer: CAT = 24. ⇒ C

Answer: (C) Go Back to Q 10

Q11.

Solution

Concept — Coding-Decoding (sum of letter positions): Word value = sum of alphabet positions of each letter.

Step 1 — Verify: SUN: S=19, U=21, N=14. Sum $= 19 + 21 + 14 = 54$ ✓.

Step 2 — MOON: M=13, O=15, O=15, N=14. Sum $= 13 + 15 + 15 + 14 =$ **57**.

Why other options are wrong:

- Option A (54): Matches SUN, not MOON.
- Option B (55): Undercounts by 2; likely misses one O.
- Option C (56): Off by 1; miscounts one letter.

Final Answer: MOON = 57. ⇒ D

Answer: (D) Go Back to Q 11

Q12.

Solution

Concept — Coding-Decoding (common word elimination): Find the code word that appears in every sentence containing the target word, and does not appear in sentences that do not contain it.

Step 1 — Sentences containing 'I': sentence 1 ('mi tu se') and sentence 3 ('mi de si'). Common code word: **mi**.

Step 2 — Sentence 2 ('tu de ra' = 'go come back') does not contain 'I', and it does not contain 'mi'. This confirms **mi** = I.

Why other options are wrong:

- Option A (tu): 'tu' appears in sentences 1 and 2; sentence 2 means 'go come back' (no 'I'), so tu $\neq$ I.
- Option C (de): 'de' appears in sentences 2 and 3; sentence 2 has no 'I', so de $\neq$ I.
- Option D (se): 'se' appears only in sentence 1; it could be 'go' or 'home', not 'I' (since 'tu' and 'se' are not in sentence 3).

Final Answer: The code for 'I' is **mi**. $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q 12

Q13.

Solution

Concept — Blood Relations (two-step tracing): Trace the family chain step by step.

Step 1 — P is Q's father. S is P's father $\Rightarrow$ S is Q's *paternal grandfather*. T is S's wife $\Rightarrow$ T is Q's *paternal grandmother*.

Step 2 — R is Q's sister (does not affect the answer; confirms P has children Q and R).

Why other options are wrong:

- Option B (Mother): T is two generations above Q; a mother is only one generation above.

- Option C (Aunt): An aunt is P's sister, not P's mother.
- Option D (Great-grandmother): Great-grandmother would be T's mother, one further generation back.

Final Answer: T is Q's Grandmother. $\Rightarrow$ A

Answer: (A) Go Back to Q 13

Q14.

Solution

Concept — Blood Relations (family tree reading): Use the given relationships to establish generational links.

Step 1 — A is mother of B. C is son of A $\Rightarrow$ B, C are siblings (A's children). D is brother of C $\Rightarrow$ D is also A's child (B, C, D are all A's children).

Step 2 — E is daughter of B. B is D's sibling (sister or brother). Therefore E (B's daughter) is D's **niece**.

Why other options are wrong:

- Option A (Daughter): E is B's daughter, not D's daughter.
- Option B (Sister): E belongs to the next generation below D; she is not D's sibling.
- Option D (Granddaughter): A's granddaughter describes E's relation to A, not to D.

Final Answer: E is D's Niece. $\Rightarrow$ C

Answer: (C) Go Back to Q 14

Q15.

Solution

Concept — Blood Relations (symbolic notation): Decode each symbol one by one, left to right.

Step 1 — $P \times Q$: P is **mother** of Q.

Step 2 — $Q + R$: Q is **father** of R $\Rightarrow$ Q is male; Q is P's son.

Step 3 — $R \div S$: R is **brother** of S $\Rightarrow$ R and S are Q's children; S is Q's child.

Step 4 — $S - T$: S is **sister** of T $\Rightarrow$ T is also Q's child.

Step 5 — P is Q's mother, and T is Q's child $\Rightarrow$ P is T's **grandmother**.

Why other options are wrong:

- Option A (Mother): P is one generation above Q, and Q is one above T; P is two generations above T.
- Option B (Sister): P is in the grandparent generation relative to T.
- Option C (Aunt): An aunt is a sibling of one's parent; P is Q's mother, not T's parent's sibling.

Final Answer: P is T's Grandmother. $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q 15

Q16.

Solution

Concept — Directions (sequential turns): Track the facing direction after each turn.

Step 1 — Start: **North**. Turn 90° clockwise $\Rightarrow$ **East**.

Step 2 — From East, turn 180° anticlockwise $\Rightarrow$ 180° anticlockwise from East = **West** (East $\rightarrow$ North $\rightarrow$ West, going CCW by 180°).

Step 3 — From West, turn 90° clockwise $\Rightarrow$ **North**.

Why other options are wrong:

- Option A (South): Would result from a net 180° turn; the actual net turn

here is 0°.

- Option C (East): Intermediate direction after step 1 only.
- Option D (West): Intermediate direction after step 2 only.

Final Answer: Sam faces North. $\Rightarrow$ B

Answer: (B) Go Back to Q 16

Q17.

Solution

Concept — Directions (displacement, closed path): Track coordinates from the starting point.

Step 1 — Start at $(0, 0)$. Walk 4 km North $\rightarrow (0, 4)$. Walk 3 km East $\rightarrow (3, 4)$. Walk 4 km South $\rightarrow (3, 0)$. Walk 3 km West $\rightarrow (0, 0)$.

Step 2 — The boy returns exactly to the starting point. Displacement $= \sqrt{(0-0)^2 + (0-0)^2} = 0$ km.

Why other options are wrong:

- Option B (4 km): Total northward displacement alone; net N-S displacement is 0.
- Option C (14 km): Total distance walked (perimeter), not displacement.
- Option D (3 km): Total eastward distance alone; net E-W displacement is 0.

Final Answer: He is 0 km from his house (back at the start). $\Rightarrow$ A

Answer: (A) Go Back to Q 17

Q18.

Solution

Concept — Directions (renamed directions): Apply the renaming map to the real direction of sunrise.

Step 1 — The sun rises in the **East** (real direction).

Step 2 — Renaming map: West→North, North→East, **East**→**South**, South→West. East is called **South**.

Why other options are wrong:

- Option A (North): North is the new name for real West.
- Option B (East): East is the new name for real North.
- Option D (West): West is the new name for real South.

Final Answer: In this system, the sun rises in the direction called South. ⇒ $\boxed{\text{C}}$

Answer: (C) Go Back to Q 18

Q19.

Solution

Concept — Linear Seating Arrangement: Derive the complete arrangement from the given clues.

Step 1 — Fixed positions: O=1 (extreme left), J=2 (2nd from left), K=3 (immediate right of J), L=6 (extreme right).

Step 2 — Remaining seats: 4 and 5 for M and N. Clue: M is immediately left of N ⇒ M=4, N=5. Check: N(5) and K(3) are not adjacent ($|5-3|=2$) ✓.

Step 3 — Final arrangement: O(1)–J(2)–K(3)–**M(4)**–N(5)–L(6). Seat immediately right of K (pos 3) = pos 4 = **M**.

Why other options are wrong:

- Option A (J): J is at position 2, to the *left* of K.
- Option B (N): N is at position 5, two seats to the right of K.
- Option C (O): O is at the extreme left (position 1).

Final Answer: M sits immediately to the right of K. ⇒ $\boxed{\text{D}}$

Answer: (D) Go Back to Q 19

Q20.

Solution

Concept — Linear Seating (counting persons between): Use the arrangement O(1)–J(2)–K(3)–M(4)–N(5)–L(6).

Step 1 — O is at position 1; N is at position 5. Persons between them (positions 2, 3, 4): J, K, M. Count = **3**.

Why other options are wrong:

- Option A (2): Undercounts; misses one of J, K, or M.
- Option C (4): Overcounts; there are only 3 people between positions 1 and 5.
- Option D (1): Severely undercounts.

Final Answer: 3 persons sit between O and N. ⇒ B

Answer: (B) Go Back to Q 20

Q21.

Solution

Concept — Linear Seating (counting from right end): Use arrangement O(1)–J(2)–K(3)–M(4)–N(5)–L(6).

Step 1 — Count from right: L(6)=1st, N(5)=2nd, **M(4)=3rd**.

Why other options are wrong:

- Option B (K): K is at position 3, which is 4th from the right.
- Option C (N): N is at position 5, which is 2nd from the right.
- Option D (J): J is at position 2, which is 5th from the right.

Final Answer: M sits 3rd from the right end. ⇒ A

Answer: (A) Go Back to Q 21

Q22.

Solution

Concept — Linear Seating (extreme ends): Use arrangement O(1)–J(2)–K(3)–M(4)–N(5)–L(6).

Step 1 — Leftmost position (1) = **O**. Rightmost position (6) = **L**. The pair at extreme ends is **O and L**.

Why other options are wrong:

- Option A (J and L): J is at position 2, not an extreme end.
- Option B (O and N): N is at position 5, not an extreme end.
- Option D (K and L): K is at position 3, not an extreme end.

Final Answer: O and L sit at the two extreme ends. $\Rightarrow$ C

Answer: (C) Go Back to Q 22

Q23.

Solution

Concept — Circular Seating Arrangement: Derive the complete arrangement clockwise (positions 1–6).

Step 1 — P and T are opposite $\Rightarrow$ if P=1, T=4. Q is immediately right of P (clockwise) $\Rightarrow$ Q=2. R is opposite Q $\Rightarrow$ R=5. S is immediately right of Q $\Rightarrow$ S=3. U fills the remaining position $\Rightarrow$ U=6.

Step 2 — Clockwise order: P(1)–Q(2)–S(3)–T(4)–R(5)–U(6). S is at position 3; directly opposite = position $3 + 3 = 6$ = **U**.

Why other options are wrong:

- Option A (T): T is opposite P (positions 1 and 4), not S.
- Option B (R): R is opposite Q (positions 2 and 5), not S.
- Option C (Q): Q is at position 2; S at 3; they are adjacent, not opposite.

Final Answer: U sits directly opposite S. $\Rightarrow$ D

Answer: (D) Go Back to Q 23

Q24.

Solution

Concept — Circular Seating (immediate neighbours): Use the clockwise arrangement P(1)–Q(2)–S(3)–T(4)–R(5)–U(6).

Step 1 — T is at position 4. Clockwise neighbour (next) = position 5 = **R**. Anticlockwise neighbour (previous) = position 3 = **S**.

Step 2 — Immediate neighbours of T are **S and R**.

Why other options are wrong:

- Option A (P and Q): P is at pos 1 and Q at pos 2; they are T's non-adjacent members.
- Option C (Q and S): Q is at pos 2, two seats from T.
- Option D (R and U): U is at pos 6, which is not adjacent to T (pos 4); only R is adjacent.

Final Answer: S and R are the immediate neighbours of T. $\Rightarrow$ B

Answer: (B) Go Back to Q 24

Q25.

Solution

Concept — Circular Seating (counting between, clockwise): Use the clockwise arrangement P(1)–Q(2)–S(3)–T(4)–R(5)–U(6).

Step 1 — Going clockwise from P(1) to R(5): pass through Q(2), S(3), T(4). That is **3 persons** between P and R.

Why other options are wrong:

- Option B (2): Undercounts; misses one of Q, S, T.
- Option C (1): Severely undercounts.
- Option D (4): Would mean going almost all the way around; clockwise P$\rightarrow$R crosses only 3 persons.

Final Answer: 3 persons sit between P and R (clockwise). $\Rightarrow$ A

Answer: (A) Go Back to Q 25

Q26.

Solution

Concept — Syllogisms (universal affirmative, transitivity): Use Venn diagram logic.

Step 1 — All computers $\subseteq$ machines; all machines $\subseteq$ things that need power. By transitivity, all computers need power. **Conclusion I follows** ✓.

Step 2 — Since all machines need power, the set "things that need power" contains machines. Thus, *some* things that need power are machines. **Conclusion II follows** ✓.

Why other options are wrong:

- Option A (only I): II also validly follows from the universal statements.
- Option B (only II): I also validly follows by transitivity.
- Option D (neither): Both conclusions are logically valid.

Final Answer: Both I and II follow. $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q 26

Q27.

Solution

Concept — Syllogisms (particular affirmative, no forced distribution): When both premises are particular ("some"), no definite conclusion can be drawn.

Step 1 — Some rivers are deep (partial overlap of rivers and deep things). Some deep things are dangerous (partial overlap of deep things and dangerous things). The "deep rivers" and "deep dangerous things" may or may not overlap. So we **cannot conclude** some rivers are dangerous. Conclusion I does not follow.

Step 2 — "All dangerous things are rivers" is a universal conclusion from particular premises – not valid. Conclusion II does not follow.

Why other options are wrong:

- Option A (I follows): There is no guaranteed link between rivers and dangerous things.
- Option B (II follows): A universal conclusion from two particular premises is

always invalid.
- Option C (both follow): Neither follows for the reasons above.

Final Answer: Neither conclusion follows. $\Rightarrow$ D

Answer: (D) Go Back to Q 27

Q28.

Solution

Concept — Syllogisms (negative + universal premises): Apply set logic carefully.

Step 1 — "No cat is a dog" $\Rightarrow$ cats and dogs are disjoint. "All dogs are loyal" $\Rightarrow$ dogs $\subseteq$ loyal. Does "no cat is loyal" follow? Not necessarily – cats could be loyal through independent reasons not mentioned. **Conclusion I does not follow**.

Step 2 — All dogs are loyal AND no dog is a cat. Therefore, dogs (a non-empty subset of loyal animals) are not cats. Hence, some loyal animals are not cats. **Conclusion II follows** ✓.

Why other options are wrong:

- Option A (only I): Conclusion I does not follow; it is not established that cats cannot be loyal.
- Option C (both): I does not follow.
- Option D (neither): II does follow validly.

Final Answer: Only Conclusion II follows. $\Rightarrow$ B

Answer: (B) Go Back to Q 28

Q29.

Solution

Concept — Syllogisms (universal + particular, deduction): Apply Barbara syllogism form.

Step 1 — All tigers are mammals (major). Simba is a tiger (minor). ⇒ Simba is a mammal. **Conclusion I follows** ✓.

Step 2 — "All mammals are tigers" would require all members of the larger set to belong to the smaller set – this is a conversion error and does not follow. **Conclusion II does not follow**.

Why other options are wrong:

- Option B (only II): II is an invalid reversal of the universal premise.
- Option C (both): II does not follow.
- Option D (neither): I clearly follows by direct deduction.

Final Answer: Only Conclusion I follows. ⇒ A

Answer: (A) Go Back to Q 29

Q30.

Solution

Concept — Statement and Assumption (implicit conditions): An assumption is something that is taken for granted in the statement, even if unstated.

Step 1 — The statement says employees will receive extra pay for overtime. For this to be a meaningful policy, *the company must have a policy for overtime compensation* (Assumption I). Without such a policy, the statement would be baseless. **I is implicit** ✓.

Step 2 — For employees to work overtime, *employees must be capable of working overtime* (Assumption II). The statement implicitly assumes this possibility exists. **II is implicit** ✓.

Why other options are wrong:

- Option A (only I): Assumption II is also implicit, as the statement presupposes overtime is feasible.

- Option B (only II): Assumption I is also implicit; a policy must underpin the promise.
- Option D (neither): Both assumptions are required for the statement to be meaningful.

Final Answer: Both I and II are implicit. $\Rightarrow$ C

Answer: (C) Go Back to Q 30

Q31.

Solution

Concept — Statement and Conclusion (strict logical validity): A conclusion must follow *strictly* from the statement without adding outside assumptions.

Step 1 — The statement says: *complete all assignments* $\Rightarrow$ *pass*. Conclusion I says "*only* those who complete assignments can pass." This is a converse error – the statement does not rule out passing by other means. **I does not follow**.

Step 2 — Conclusion II says completing assignments is a *sufficient guarantee*. While "will" suggests certainty, external factors (illness, examination irregularity, etc.) may also affect the outcome, so this is not an absolute guarantee derivable solely from the statement. **II does not follow** strictly.

Why other options are wrong:

- Option A (only I): I involves the logical fallacy of the converse.
- Option B (only II): II overstates certainty beyond what is logically guaranteed.
- Option C (both): Neither conclusion follows strictly.

Final Answer: Neither conclusion follows. $\Rightarrow$ D

Answer: (D) Go Back to Q 31

Q32.

Solution

Concept — Mathematical Operations (identify hidden rule): Find the operation ■ such that a■b matches all given rows.

Step 1 — Test rule a■$b = a^2 - b$:

- $6^2 - 2 = 36 - 4 = 32$ ✓
- $8^2 - 3 = 64 - 9 = 55$ ✓
- $5^2 - 4 = 25 - 4 = 21$ ✓

Step 2 — Apply rule: 9■$3 = 9^2 - 3 = 81 - 3 =$ **78**.

Why other options are wrong:

- Option A (72): $9^2 - 9 = 72$; subtracts b^2 instead of b.
- Option C (84): $9 \times 9 + 3 = 84$; a different rule that doesn't fit the data.
- Option D (63): $9 \times 7 = 63$; no consistent rule fits this.

Final Answer: 9■$3 = 78$. $\Rightarrow$ B

Answer: (B) Go Back to Q 32

Q33.

Solution

Concept — Ranking (total count from both ends): If a person is Lth from the left and Rth from the right in a row, total students $= L + R - 1$.

Step 1 — Arjun: $L = 15$, $R = 11$. Total $= 15 + 11 - 1 =$ **25**.

Why other options are wrong:

- Option B (26): $15 + 11 = 26$ (forgets to subtract 1 for Arjun himself being counted twice).
- Option C (24): Off by 1 in the wrong direction.
- Option D (27): Overcounts by 2.

Final Answer: There are 25 students in the row. $\Rightarrow$ A

Answer: (A) Go Back to Q 33

Q34.

Solution

Concept — Ranking (position from a given order): The sequence X, Y, Z, W, V, U is already listed in decreasing order of age (oldest to youngest).

Step 1 — X = 1st (oldest), Y = 2nd, **Z = 3rd**, W = 4th, V = 5th, U = 6th (youngest).

Step 2 — Z is at the 3rd position from the oldest.

Why other options are wrong:

- Option A (1st): X is the oldest; Z comes after X and Y.
- Option B (2nd): Y is 2nd; Z is listed after Y.
- Option D (4th): W is 4th; Z is listed before W.

Final Answer: Z's rank from the oldest is 3rd. $\Rightarrow$ C

Answer: (C) Go Back to Q 34

Q35.

Solution

Concept — Ranking (total count from both ends): Total in queue = (position from front) + (position from back) − 1.

Step 1 — Hari: 8th from front, 10th from back. Total $= 8 + 10 - 1 =$ **17**.

Why other options are wrong:

- Option A (16): $8 + 10 - 2 = 16$; subtracts 2 instead of 1.
- Option B (15): Omits one of the counts.
- Option C (18): $8 + 10 = 18$; does not subtract 1 for Hari being counted in both.

Final Answer: There are 17 people in the queue. $\Rightarrow$ D

Answer: (D) Go Back to Q 35

Q36.

Solution

Concept — Venn Diagrams (only one set): Use the inclusion-exclusion principle.

Step 1 — $n(\text{Hindi only}) = 30-15 = 15$. $n(\text{both}) = 15$. $n(\text{English only}) = 25-15 = 10$.

Step 2 — Verify total: $15+15+10 = 40 \leq 50$ ✓ (10 students study neither subject).

Why other options are wrong:

- Option A (15): This is the "both" count, not "English only".
- Option C (25): This is the total English count, including those who also study Hindi.
- Option D (5): Incorrect subtraction.

Final Answer: 10 students study only English. $\Rightarrow$ B

Answer: (B) Go Back to Q 36

Q37.

Solution

Concept — Venn Diagrams (intersection from union formula): Apply $n(A \cup B) = n(A) + n(B) - n(A \cap B)$.

Step 1 — $40 = 25 + 20 - n(A \cap B)$.

Step 2 — $n(A \cap B) = 25 + 20 - 40 = \mathbf{5}$.

Why other options are wrong:

- Option B (10): $25 + 20 - 10 = 35 \neq 40$.
- Option C (15): $25 + 20 - 15 = 30 \neq 40$.
- Option D (20): $25 + 20 - 20 = 25 \neq 40$.

Final Answer: $n(A \cap B) = 5$. $\Rightarrow$ A

Answer: (A) Go Back to Q 37

Q38.

Solution

Concept — Data Sufficiency (system of equations): Check whether each statement alone or together can uniquely determine $a + b$.

Step 1 — Statement I alone: $2a - b = 10$ – one equation, two unknowns. Infinitely many solutions. **Not sufficient alone**.

Step 2 — Statement II alone: $a - 2b = 5$ – one equation, two unknowns. Infinitely many solutions. **Not sufficient alone**.

Step 3 — Together: Solve the system: $2a - b = 10$ and $a - 2b = 5$. From II: $a = 5 + 2b$. Substitute: $2(5 + 2b) - b = 10 \Rightarrow 10 + 4b - b = 10 \Rightarrow 3b = 0 \Rightarrow b = 0$. Then $a = 5$. So $a + b = 5$. **Both together are sufficient ✓**.

Why other options are wrong:

- Option A: I alone cannot determine two unknowns.
- Option B: II alone cannot determine two unknowns.
- Option D: Together they uniquely determine the answer.

Final Answer: Both statements together are sufficient, but neither alone is sufficient. $\Rightarrow$ C

Answer: (C) Go Back to Q 38

Q39.

Solution

Concept — Data Sufficiency (insufficient constraints): Check whether each statement alone or combined determines the tens digit uniquely.

Step 1 — Statement I alone: "The number is odd." Odd two-digit numbers: 11, 13, . . ., 99. Tens digits can be 1, 2, . . ., 9. **Not sufficient alone**.

Step 2 — Statement II alone: "The number is greater than 50." Two-digit numbers > 50: 51 to 99. Tens digits can be 5, 6, 7, 8, or 9. **Not sufficient alone**.

Step 3 — Together: Odd numbers greater than 50: 51, 53, 55, . . . , 99. Tens digits: 5, 6, 7, 8, 9 (e.g. 51 has tens digit 5; 71 has tens digit 7). Still **not unique**. **Not sufficient together**.

Why other options are wrong:

- Option A: I alone gives many possible tens digits.
- Option B: II alone does not pin down a unique tens digit (5 through 9 are all possible).
- Option C: Combined still yields tens digits 5, 6, 7, 8, 9 – not unique.

Final Answer: Both statements together are also not sufficient. $\Rightarrow$ D

Answer: (D) Go Back to Q 39

Q40.

Solution

Concept — Clock (coincidence of hands): The minute hand gains $360 - 30 = 330$ over the hour hand per hour (minute hand moves 360°/hr; hour hand moves 30°/hr). They coincide when the minute hand has gained a full 360° on the hour hand.

Step 1 — Time between two successive coincidences $= \dfrac{360}{330/\text{hr}} = \dfrac{12}{11}$ hours $= \dfrac{720}{11}$ minutes.

Step 2 — Number of coincidences in 12 hours $= \dfrac{12 \text{ hr}}{(12/11) \text{ hr}} = 11$ times. In 24 hours: $11 \times 2 = \mathbf{22}$ times.

Step 3 — Intuitive check: one might expect 24 times (once per hour), but the 12:00 coincidence is shared between the two halves of the day, giving $11 + 11 = 22$.

Why other options are wrong:

- Option A (20): Undercounts; misses two coincidences.
- Option C (24): Naive answer assuming once per hour – incorrect because the hour hand also moves.
- Option D (44): Double the correct answer; coincidences in 24 hours are 22, not 44.

Final Answer: The hands coincide 22 times in 24 hours. $\Rightarrow$ B

Answer: (B) Go Back to Q 40

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	C	3	B	4	D	5	A
6	C	7	B	8	D	9	A	10	C
11	D	12	B	13	A	14	C	15	D
16	B	17	A	18	C	19	D	20	B
21	A	22	C	23	D	24	B	25	A
26	C	27	D	28	B	29	A	30	C
31	D	32	B	33	A	34	C	35	D
36	B	37	A	38	C	39	D	40	B