ATMA Analytical Reasoning Skills Sample Paper – 1

Duration: 60 Minutes **Maximum Marks: 60**

Instructions

- This paper contains **60** Multiple Choice Questions (Single Correct Answer) in two parts (Part I and Part II), modelled on the Analytical Reasoning Skills portion of **ATMA** entrance.
- Each correct answer carries **+1 marks**. There is **a penalty of** 0.25 **mark** for each incorrect answer; unattempted questions carry **0** marks.
- Only **one** option is correct. Choose carefully.
- Syllabus level: **Logical reasoning & data interpretation (ATMA Analytical Reasoning Skills)**
- Use of mobile phones, calculators, or electronic gadgets is strictly prohibited.

Part I: Analytical Reasoning Skills

Q1. Find the next term in the series: $3,\ 6,\ 11,\ 18,\ 27,\ ?$

(A) 34

(B) 36

(C) 38

(D) 40

Q2. Find the next term in the letter series: $C,\ F,\ I,\ L,\ O,\ ?$

(A) Q

(B) R

(C) S

(D) P

Q3. **Doctor** is to **Hospital** as **Teacher** is to:

(A) Student

(B) School

(C) Book

(D) Lesson

Q4. $5 : 36 \ :: \ 7 : ?$ (the relationship is the same in both pairs)

(A) 64

(B) 49

(C) 56

(D) 81

Q5. Four of the following five are alike in a certain way and form a group. Which is the one that does NOT belong to that group? $16,\ 36,\ 64,\ 70,\ 100$

(A) 36

(B) 64

(C) 70

(D) 100

Q6. In a certain code, TIGER is written as WLJHU. How is LION written in that code?

(A) $OLRP$

(B) $NKQP$

(C) $MJPO$

(D) $OLRQ$

Q7. In a certain code, MANGO is coded as LZMFN (each letter shifted by the same rule). Using the same rule, what is the code for PEACH?

(A) $ODZBG$

(B) $QFBDI$

(C) $ODYBG$

(D) $NCZAG$

Q8. Pointing to a photograph, Rohit said, "She is the daughter of my grandfather's only son." How is the girl in the photograph related to Rohit?

(A) Mother

(B) Aunt

(C) Sister

(D) Niece

Q9. If $A + B$ means A is the mother of B; $A - B$ means A is the brother of B; $A \times B$ means A is the father of B. Then which of the following shows that P is the maternal uncle of Q?

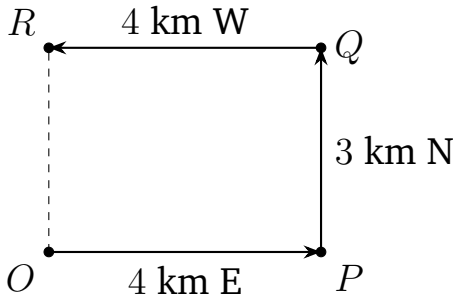
(A) $P + S \times Q$

(B) $P - S + Q$

(C) $P \times S - Q$

(D) $P - S - Q$

Q10. A delivery rider starts at point O, walks 4 km East to P, then 3 km North to Q, then 4 km West to R. The route is shown below. How far and in which direction is the rider now (at R) from the starting point O?



(A) 5 km East

(B) 4 km South

(C) 3 km North

(D) 7 km North

Q11. **Directions (Q11–Q13):** Eight friends — P, Q, R, S, T, U, V, W — sit in a single straight row, all facing North. The seats are numbered 1 to 8 from left to right (as you look at them). The seating is shown below.

P	U	S	T	W	Q	V	R
Seat 1	Seat 2	Seat 3	Seat 4	Seat 5	Seat 6	Seat 7	Seat 8

(All facing North)

Q11. Who sits at the extreme right end of the row?

(A) P

(B) V

(C) W

(D) R

Q12. Using the same arrangement as in Q11, who sits exactly between S and W?

(A) U

(B) T

(C) Q

(D) V

Q13. Using the same arrangement as in Q11, how many friends sit to the right of T?

(A) Four

(B) Three

(C) Five

(D) Two

Q14. Five boxes — A, B, C, D, E — are stacked one above the other. C is immediately above A. B is at the bottom. E is immediately above C. D is immediately above E. Which box is exactly in the middle of the stack?

(A) A

(B) C

(C) E

(D) D

Q15. In a week from Monday to Friday, four lectures — Maths, Physics, Chemistry and Biology — are scheduled on four different days, with exactly one day having no lecture. Physics is on Monday. Biology is exactly two days after Physics. Chemistry is immediately before Biology. Maths is immediately after Biology. On which day is Maths scheduled?

(A) Tuesday

(B) Wednesday

(C) Friday

(D) Thursday

Q16. **Statements:** All pens are markers. All markers are inks.
Conclusions: (I) All pens are inks. (II) Some inks are pens.
Which conclusion(s) logically follow(s)?

(A) Both I and II follow

(B) Only I follows

(C) Only II follows

(D) Neither I nor II follows

Q17. **Statements:** Some cats are dogs. No dog is a horse.
Conclusions: (I) Some cats are not horses. (II) All cats are horses.
Which conclusion(s) logically follow(s)?

(A) Both I and II follow

(B) Only II follows

(C) Neither I nor II follows

(D) Only I follows

Q18. **Statement:** "Please submit the form online before the last date to avoid the late fee," a notice from a university reads.
Assumptions: (I) Applicants have access to the internet to submit online. (II) Submitting before the last date helps avoid a penalty.
Which assumption(s) is/are implicit?

(A) Only I is implicit

(B) Both I and II are implicit

(C) Only II is implicit

(D) Neither is implicit

Q19. **Statement:** All employees who completed the safety training were given a certificate. Ravi was not given a certificate.
Conclusion: Ravi did not complete the safety training.
Does the conclusion follow?

(A) The conclusion does not follow

(B) Data is insufficient

(C) The conclusion follows

(D) The conclusion is probably false

Q20. If $P > Q$, $Q \geq R$, $R > S$ and $S \geq T$, then which of the following is definitely TRUE?

(A) $P > T$

(B) $T \geq P$

(C) $R < T$

(D) $Q < S$

Q21. In a row of students, Meera is 11th from the left and 19th from the right. How many students are there in the row?

(A) 28

(B) 29

(C) 30

(D) 31

Q22. If 1 January 2024 is a Monday, what day of the week is 1 February 2024? (Note: 2024 is a leap year; January has 31 days.)

(A) Wednesday

(B) Thursday

(C) Friday

(D) Tuesday

Q23. Find the missing number that completes the pattern: $4,\ 9,\ 19,\ 39,\ ?,\ 159$

(A) 69

(B) 89

(C) 79

(D) 99

Q24. **Question:** What is the two-digit number?
Statement I: The sum of its digits is 9.
Statement II: The number is exactly divisible by 9 and its tens digit is 4.
Which statement(s) is/are sufficient to answer the question?

(A) Statement I alone is sufficient

(B) Both together are needed, neither alone

(C) Statement II alone is sufficient

(D) Neither is sufficient

Q25. **Question:** Is x greater than y?
Statement I: $x + 5 = y + 8$.
Statement II: x and y are both positive integers.
Which statement(s) is/are sufficient to answer the question?

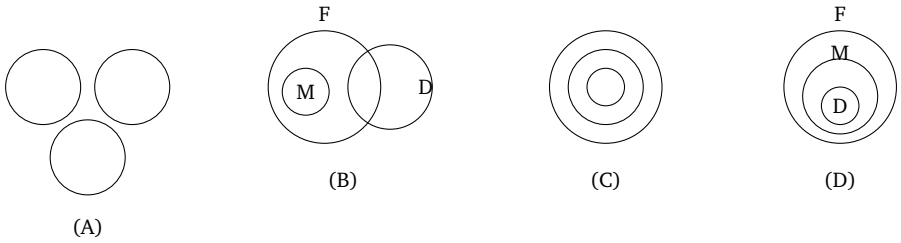
(A) Statement II alone is sufficient

(B) Both together are needed

(C) Neither is sufficient

(D) Statement I alone is sufficient

Q26. Which of the following diagrams best represents the relationship among **Females**, **Mothers** and **Doctors**? (A mother is always a female; a doctor may or may not be a female, and a female may or may not be a mother or doctor.)



(A) (B) (C) (D)

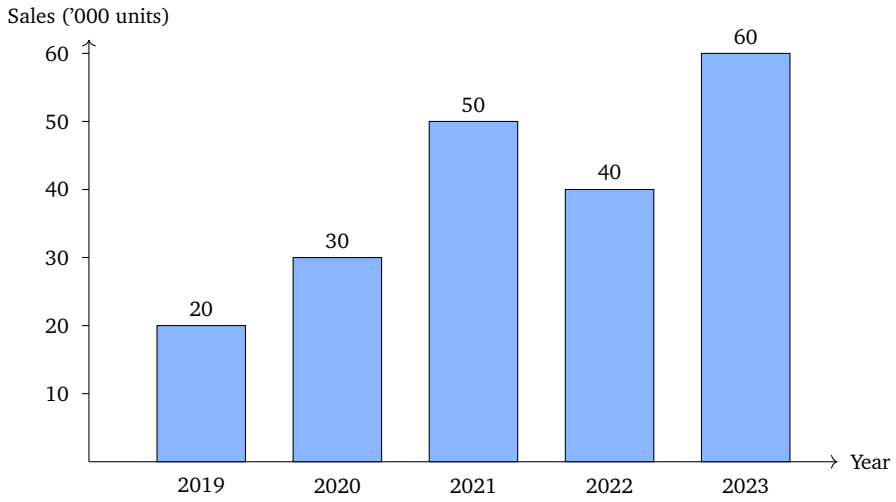
(A) Diagram (A)

(B) Diagram (B)

(C) Diagram (C)

(D) Diagram (D)

Q27. **Directions (Q27–Q30):** The bar graph shows the annual sales (in thousands of units) of a product made by *Zenith Ltd.* over five years.



Q27. What is the total sales (in thousand units) over the five years 2019 to 2023?

(A) 190

(B) 200

(C) 210

(D) 180

Q28. Using the same bar graph (Q27), what is the percentage increase in sales from 2020 to 2021?

(A) $66.\overline{6}\%$

(B) 40%

(C) 50%

(D) 60%

Q29. Using the same bar graph (Q27), what is the ratio of sales in 2019 to sales in 2022?

(A) $2:3$

(B) $3:2$

(C) $1:2$

(D) $1:3$

Q30. Using the same bar graph (Q27), what is the average annual sales (in thousand units) over the five years?

(A) 42

(B) 44

(C) 38

(D) 40

Part II: Analytical Reasoning Skills

Q31. Find the next term in the series: $5,\ 11,\ 23,\ 47,\ ?$

(A) 93

(B) 94

(C) 95

(D) 96

Q32. Find the next term in the series: $2,\ 6,\ 12,\ 20,\ 30,\ ?$

(A) 40

(B) 42

(C) 44

(D) 46

Q33. ACE : BDF :: PRT :? (the relationship is the same in both pairs)

(A) QSU

(B) QSV

(C) OQS

(D) QTV

Q34. $8 : 512 :: 6 :?$ (the relationship is the same in both pairs)

(A) 196

(B) 216

(C) 232

(D) 144

Q35. Four of the following five are alike in a certain way and form a group. Which is the one that does NOT belong to that group? $13,\ 17,\ 19,\ 21,\ 23$

(A) 13

(B) 17

(C) 19

(D) 21

Q36. In a certain code, FROST is written as HTQUV. How is CLOUD written in that code?

(A) $ENQWF$

(B) $ENRWF$

(C) $DMPVE$

(D) $ENQVF$

Q37. In a certain code, CAB $= 6$ and BED $= 11$ (each letter taking its position value $A = 1, B = 2, \ldots$ and the values summed). Using the same rule, what is the code for FED?

(A) 13

(B) 14

(C) 15

(D) 16

Q38. Pointing to a man, Sara said, "His mother is the only daughter of my mother." How is the man related to Sara?

Sara's mother
↓
Sara (only daughter) "Only daughter of my mother" = Sara herself
↓
Man

(A) Brother

(B) Uncle

(C) Nephew

(D) Son

Q39. If $A \div B$ means A is the father of B; $A \times B$ means A is the sister of B; $A + B$ means A is the wife of B. Which of the following means M is the daughter of N?

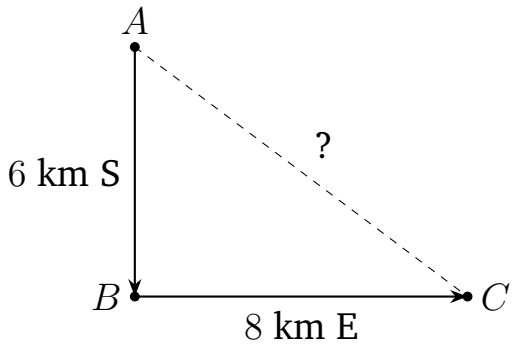
(A) $M \times P \div N$

(B) $N \div M \times P$

(C) $N + P \div M$

(D) $M + P \times N$

Q40. A jogger starts at point A, runs 6 km South to B, then 8 km East to C. How far is the jogger now (at C) from the starting point A (straight-line distance)?



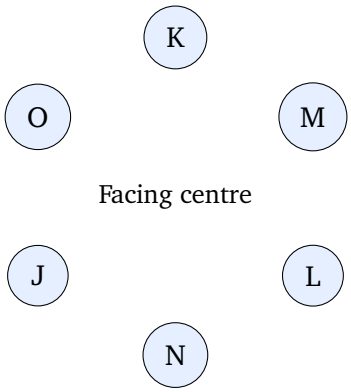
(A) 12 km

(B) 14 km

(C) 10 km

(D) 11 km

Q41. **Directions (Q41–Q43):** Six people — $J,\ K,\ L,\ M,\ N,\ O$ — sit around a circular table facing the centre. M is to the immediate right of K. O is to the immediate left of K. L sits between M and N. J is to the immediate right of N. The seating is shown below.



Q41. Who sits exactly opposite to K?

(A) J

(B) L

(C) N

(D) M

Q42. Using the same arrangement as in Q41, who sits to the immediate right of N?

(A) K

(B) M

(C) J

(D) O

Q43. Using the same arrangement as in Q41, which of the following pairs are immediate neighbours of L?

(A) M and N

(B) J and K

(C) K and O

(D) O and N

Q44. Five students — P, Q, R, S, T — are arranged by height. R is taller than Q but shorter than S. T is the shortest. P is taller than S. Who is the second tallest?

(A) P

(B) R

(C) S

(D) Q

Q45. In a building of five floors numbered 1 (lowest) to 5 (highest), four people — W, X, Y, Z — live on four different floors, one floor being vacant. W lives on floor 4. Y lives immediately below W. X lives on the topmost floor. Z lives on an even-numbered floor. Which floor is vacant?

(A) Floor 1

(B) Floor 2

(C) Floor 3

(D) Floor 5

Q46. **Statements:** All roses are flowers. Some flowers are red.
Conclusions: (I) Some roses are red. (II) Some flowers are roses.
Which conclusion(s) logically follow(s)?

(A) Only II follows

(B) Only I follows

(C) Both I and II follow

(D) Neither I nor II follows

Q47. **Statements:** No book is a pen. All pens are pencils.
Conclusions: (I) Some pencils are not books. (II) No book is a pencil.
Which conclusion(s) logically follow(s)?

(A) Both I and II follow

(B) Only II follows

(C) Only I follows

(D) Neither I nor II follows

Q48. **Statement:** "Buy our new water purifier and stay healthy," reads an advertisement.
Assumptions: (I) People are concerned about their health. (II) The purifier improves water quality.
Which assumption(s) is/are implicit?

(A) Only I is implicit

(B) Only II is implicit

(C) Neither is implicit

(D) Both I and II are implicit

Q49. **Statement:** Every student who scored above 90% received a scholarship. Neha received a scholarship.
Conclusion: Neha scored above 90%.
Does the conclusion follow?

(A) The conclusion follows

(B) The conclusion does not follow

(C) The conclusion is certainly true

(D) The conclusion is the contrapositive

Q50. If $A \geq B$, $B > C$, $C \geq D$ and $D > E$, then which of the following is definitely TRUE?

(A) $A > E$

(B) $E \geq A$

(C) $C < E$

(D) $B \leq D$

Q51. In a class, Arjun is ranked 7th from the top and 26th from the bottom. How many students are there in the class?

(A) 31

(B) 33

(C) 34

(D) 32

Q52. Through how many degrees does the minute hand of a clock move in 20 minutes?

(A) 100°

(B) 90°

(C) 120°

(D) 150°

Q53. Find the missing number that completes the pattern: $7,\ 14,\ 28,\ ?,\ 112$

(A) 42

(B) 56

(C) 48

(D) 64

Q54. **Question:** How old is Ramesh now?

Statement I: Five years ago Ramesh was 3 times as old as his son, who is now 15.

Statement II: Ramesh is older than his son.

Which statement(s) is/are sufficient to answer the question?

(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both together are needed

(D) Neither is sufficient

Q55. **Question:** Is the integer n even?
Statement I: $n + 3$ is odd.
Statement II: $2n$ is divisible by 4.
Which statement(s) is/are sufficient to answer the question?

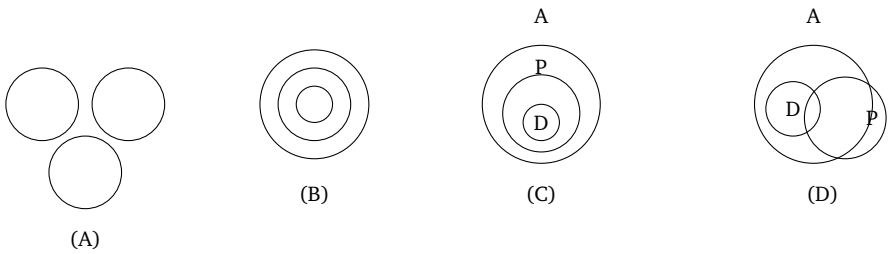
(A) Statement I alone only

(B) Statement II alone only

(C) Either statement alone is sufficient

(D) Neither is sufficient

Q56. Which of the following diagrams best represents the relationship among **Animals**, **Dogs** and **Pets**? (Every dog is an animal; some dogs are pets and some pets are animals that are not dogs.)



(A) Diagram (A)

(B) Diagram (B)

(C) Diagram (C)

(D) Diagram (D)

Q57. **Directions (Q57–Q60):** The table shows the number of books (in hundreds) sold by a store across four categories in two years.

Category	2022	2023
Fiction	30	40
Science	20	35
History	25	25
Comics	15	20

Q57. What is the total number of books (in hundreds) sold in 2023 across all four categories?

(A) 110

(B) 120

(C) 90

(D) 130

Q58. Using the same table (Q57), for which category was the increase in sales from 2022 to 2023 the largest?

(A) Science

(B) Fiction

(C) Comics

(D) History

Q59. Using the same table (Q57), what is the ratio of Fiction books sold in 2022 to Science books sold in 2023?

(A) 7 : 6

(B) 6 : 7

(C) 3 : 4

(D) 4 : 3

Q60. Using the same table (Q57), the total sales in 2022 across all categories was how much less than the total in 2023? (Express as a percentage of the 2023 total, rounded to the nearest whole number.)

(A) 30%

(B) 20%

(C) 25%

(D) 33%

Detailed Solutions

Q1.

Solution

Concept — Number series: Look at the differences between consecutive terms to spot a pattern.

Step 1 — Differences: $6-3=3$, $11-6=5$, $18-11=7$, $27-18=9$.

Step 2 — Pattern: The differences are $3, 5, 7, 9$ (consecutive odd numbers). The next difference is 11.

Step 3 — Next term: $27+11=38$.

Why other options are wrong:

- $34, 36$: would require a difference of 7 or 9, but the pattern needs 11.
- 40: would need a difference of 13, skipping 11.

Final Answer: $27+11=38 \Rightarrow$ C

Answer: (C) Go Back to Q 1

Q2.

Solution

Concept — Letter series: Convert letters to positions and find the step.

Step 1 — Positions: $C(3),\ F(6),\ I(9),\ L(12),\ O(15)$.

Step 2 — Pattern: Each term increases by 3: $3, 6, 9, 12, 15$. Next position $= 15+3 = 18$.

Step 3 — Letter: Position 18 is R.

Why other options are wrong:

- $Q(17),\ S(19),\ P(16)$: none equals position 18.

Final Answer: Position $18 = R \Rightarrow$ B

Answer: (B) Go Back to Q 2

Q3.

Solution

Concept — Word analogy: Identify the relationship in the first pair and apply it to the second.

Step 1 — First pair: A doctor's primary place of work is a hospital (worker : workplace).

Step 2 — Apply: A teacher's primary place of work is a school.

Why other options are wrong:

- Student: the person a teacher serves, not the workplace.
- Book / Lesson: tools or content used, not a workplace.

Final Answer: Teacher : School $\Rightarrow$ B

Answer: (B) Go Back to Q 3

Q4.

Solution

Concept — Number analogy: Find an arithmetic rule linking 5 to 36.

Step 1 — Test rule: $5 \to 36$. Check $(5+1)^2 = 6^2 = 36$. It works.

Step 2 — Apply: $(7+1)^2 = 8^2 = 64$.

Why other options are wrong:

- $49 = 7^2$: would need the rule n^2, but $5^2 = 25 \neq 36$.
- $56, 81$: do not match $(n+1)^2$.

Final Answer: $(7+1)^2 = 64 \Rightarrow$ A

Answer: (A) Go Back to Q 4

Q5.

Solution

Concept — Classification: Find the common property of four of the five numbers.

Step 1 — Check perfect squares: $16 = 4^2$, $36 = 6^2$, $64 = 8^2$, $100 = 10^2$ are all perfect squares.

Step 2 — Odd one out: 70 is not a perfect square ($8^2 = 64$, $9^2 = 81$).

Why other options are wrong:

- $36, 64, 100$: all perfect squares, so they belong to the group.

Final Answer: 70 is not a perfect square $\Rightarrow$ C

Answer: (C) Go Back to Q 5

Q6.

Solution

Concept — Coding (letter shift): Compare each letter of the code with the original to find the shift.

Step 1 — Find rule from TIGER $\rightarrow$ WLJHU: $T(20) \rightarrow W(23)$ is $+3$; $I(9) \rightarrow L(12)$ is $+3$; $G \rightarrow J$ is $+3$; $E \rightarrow H$ is $+3$; $R \rightarrow U$ is $+3$. So each letter shifts forward by 3.

Step 2 — Apply to LION: $L(12) \rightarrow O(15)$; $I(9) \rightarrow L(12)$; $O(15) \rightarrow R(18)$; $N(14) \rightarrow Q(17)$.

Step 3 — Code: $OLRQ$.

Why other options are wrong:

- $OLRP$: last letter should be $Q(17)$, not $P(16)$.
- $NKQP, MJPO$: use a wrong shift on one or more letters.

Final Answer: LION $\rightarrow OLRQ \Rightarrow$ D

Answer: (D) Go Back to Q 6

Q7.

Solution

Concept — Coding (letter shift): Determine the shift from MANGO $\rightarrow$ LZMFN.

Step 1 — Find rule: $M(13) \rightarrow L(12)$ is -1; $A(1) \rightarrow Z(26)$ is -1 (wrap); $N(14) \rightarrow M(13)$ is -1; $G(7) \rightarrow F(6)$ is -1; $O(15) \rightarrow N(14)$ is -1. So each letter shifts backward by 1.

Step 2 — Apply to PEACH: $P(16) \rightarrow O(15)$; $E(5) \rightarrow D(4)$; $A(1) \rightarrow Z(26)$; $C(3) \rightarrow B(2)$; $H(8) \rightarrow G(7)$.

Step 3 — Code: $ODZBG$.

Why other options are wrong:

- $QFBDI$: this is $+1$, the opposite direction.
- $ODYBG$: third letter should be Z (from A wrapping), not Y.
- $NCZAG$: uses a -2 shift on the first two letters.

Final Answer: PEACH $\rightarrow ODZBG \Rightarrow$ A

Answer: (A) Go Back to Q 7

Q8.

Solution

Concept — Blood relations: Decode the statement piece by piece, then draw a family tree.

Step 1 — "My grandfather's only son": A grandfather's only son is Rohit's father (since Rohit exists, his father must be that son).

Step 2 — "The daughter of my father": The daughter of Rohit's father is Rohit's sister.

Family tree:

Grandfather
↓
Father (only son)
↙ ↘
Rohit Girl (photo)
Rohit and the girl share the same father
$\Rightarrow$ siblings

Why other options are wrong:

- Mother / Aunt: would belong to an older generation; the girl is Rohit's father's daughter, same generation as Rohit.
- Niece: would be a generation below; not the case here.

Final Answer: The girl is Rohit's sister $\Rightarrow$ C

Answer: (C) Go Back to Q 8

Q9.

Solution

Concept — Coded relations: P is the maternal uncle of Q means P is the brother of Q's mother.

Step 1 — Test option (A) $P+S\times Q$: $P+S$ means P is mother of S; $S\times Q$ means S is father of Q. So P is grandmother of Q. Wrong.

Step 2 — Test option (B) $P-S+Q$: $P-S$ means P is the brother of S; $S+Q$ means S is the mother of Q. So S is Q's mother and P is S's brother $\Rightarrow$ P is the maternal uncle of Q. Correct.

Why other options are wrong:

- (C) $P\times S-Q$: P is father of S, S is brother of $Q \Rightarrow P$ is father of Q.
- (D) $P-S-Q$: P, S, Q are all brothers $\Rightarrow$ P is Q's brother, not maternal uncle.

Final Answer: $P-S+Q$ gives the maternal uncle relation $\Rightarrow$ B

Answer: (B) Go Back to Q 9

Q10.

Solution

Concept — Direction sense: Track the position using coordinates (East $=+x$, North $=+y$).

Step 1 — Coordinates: Start $O=(0,0)$. East 4: $P=(4,0)$. North 3: $Q=(4,3)$. West 4: $R=(0,3)$.

Step 2 — Compare R to O: $R=(0,3)$ and $O=(0,0)$. The x-coordinate is the same; R is 3 units higher (North).

Step 3 — Distance & direction: R is 3 km due North of O.

Why other options are wrong:

- 5 km East: there is no eastward displacement (the East and West legs cancel).
- 4 km South / 7 km North: the net North displacement is 3 km, not 4 or 7.

Final Answer: 3 km North $\Rightarrow$ C

Answer: (C) Go Back to Q 10

Q11.

Solution

Concept — Linear seating: Read positions directly from the given row (seats 1–8, left to right, all facing North).

Step 1 — Order: Seat $1{=}P$, $2{=}U$, $3{=}S$, $4{=}T$, $5{=}W$, $6{=}Q$, $7{=}V$, $8{=}R$.

Step 2 — Extreme right end: Since all face North, the extreme right end is seat 8, which is R.

Why other options are wrong:

- P: at the extreme left (seat 1).
- V: at seat 7, second from the right.
- W: at seat 5, in the middle area.

Final Answer: Seat $8 = R \Rightarrow$ D

Answer: (D) Go Back to Q 11

Q12.

Solution

Concept — Linear seating: Locate S and W, then find who sits between them.

Step 1 — Positions: S is at seat 3, W is at seat 5.

Step 2 — Between: The seat between 3 and 5 is seat 4, which is T.

Why other options are wrong:

- U (seat 2), Q (seat 6), V (seat 7): none lies between seats 3 and 5.

Final Answer: Seat $4 = T \Rightarrow$ B

Answer: (B) Go Back to Q 12

Q13.

Solution

Concept — Linear seating: Count the seats to the right of the target.

Step 1 — Position of T: T is at seat 4.

Step 2 — Seats to the right: Seats $5, 6, 7, 8$ hold W, Q, V, R — that is 4 friends.

Why other options are wrong:

- Three: would be the count to the right of seat 5, not seat 4.
- Five / Two: do not match four occupied seats 5–8.

Final Answer: 4 friends sit to the right of $T \Rightarrow$ A

Answer: (A) Go Back to Q 13

Q14.

Solution

Concept — Stacking puzzle: Build the stack bottom-to-top from the clues.

Step 1 — Place clues: B is at the bottom. C is immediately above A. E is immediately above C. D is immediately above E.

Step 2 — Assemble: From bottom: B, then A, then C (above A), then E (above C), then D (above E). Stack from top to bottom: D, E, C, A, B.

Step 3 — Middle of five: The middle (3rd from either end) position holds C.

Why other options are wrong:

- A: 2nd from bottom, not middle.
- E: 4th from bottom (2nd from top).
- D: at the very top.

Final Answer: Middle box is C $\Rightarrow$ B

Answer: (B) Go Back to Q 14

Q15.

Solution

Concept — Day scheduling: Place fixed clues, then fill the remaining day.

Step 1 — Days: Mon, Tue, Wed, Thu, Fri (five days, four lectures, one free day).

Step 2 — Place clues: Physics = Monday. "Biology two days after Physics" $\Rightarrow$ Biology = Wednesday. "Chemistry immediately before Biology" $\Rightarrow$ Chemistry = Tuesday.

Step 3 — Place Maths: "Maths immediately after Biology" and Biology = Wednesday $\Rightarrow$ Maths = Thursday.

Verify: Mon = Physics, Tue = Chemistry, Wed = Biology, Thu = Maths, Fri = free. Four lectures on four days with exactly one free day (Friday), as required.

Why other options are wrong:

- Tuesday / Wednesday: already taken by Chemistry and Biology.
- Friday: this is the free (no-lecture) day; Maths sits immediately after Biology, i.e. Thursday.

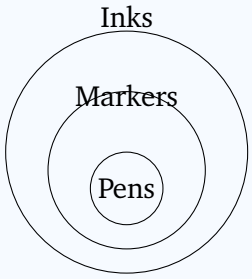
Final Answer: Maths is on Thursday $\Rightarrow$ D

Answer: (D) Go Back to Q 15

Q16.

Solution

Concept — Syllogism: Use a Venn diagram for "All A are B, All B are C."



Step 1 — Conclusion I (All pens are inks): Pens $\subseteq$ Markers $\subseteq$ Inks, so every pen is an ink. **Follows.**

Step 2 — Conclusion II (Some inks are pens): Since all pens are inks and pens exist, the pens form a subset of inks, so some inks are indeed pens. **Follows** (the valid converse of "All pens are inks").

Why other options are wrong:

- "Only I" / "Only II": both conclusions are valid, so neither single-choice fits.
- "Neither": both clearly follow from the nested circles.

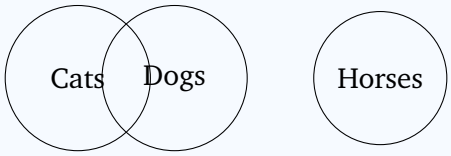
Final Answer: Both I and II follow $\Rightarrow$ A

Answer: (A) Go Back to Q 16

Q17.

Solution

Concept — Syllogism: "Some cats are dogs" and "No dog is a horse."



$\text{Cats} \cap \text{Dogs} \neq \varnothing;\ \text{Dogs} \cap \text{Horses} = \varnothing$

Step 1 — Conclusion I (Some cats are not horses): The cats that are dogs cannot be horses (No dog is a horse). So at least those cats are not horses. **Follows.**

Step 2 — Conclusion II (All cats are horses): The cat-dogs are definitely not horses, so it is impossible that all cats are horses. **Does not follow.**

Why other options are wrong:

- "Only II" / "Both": II is false, so any choice including II fails.
- "Neither": I is valid, so this is wrong.

Final Answer: Only I follows $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q 17

Q18.

Solution

Concept — Statement & Assumption: An assumption is something taken for granted that the statement depends on.

Step 1 — Assumption I: The notice tells people to submit *online*, which presumes applicants can access the internet. This is necessary for the instruction to make sense. **Implicit.**

Step 2 — Assumption II: "Submit before the last date to avoid the late fee" presumes that doing so actually helps avoid a penalty. **Implicit.**

Step 3 — Both: Both I and II are taken for granted by the notice.

Why other options are wrong:

- "Only I" / "Only II": each leaves out a genuine implicit assumption.
- "Neither": both are clearly assumed.

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

Answer: (B) Go Back to Q 18

Q19.

Solution

Concept — Statement & Conclusion (contrapositive): "All who completed training got a certificate" means: completed $\Rightarrow$ certificate.

Step 1 — Contrapositive: "No certificate $\Rightarrow$ did not complete training." This is logically equivalent to the original statement.

Step 2 — Apply: Ravi was not given a certificate, so by the contrapositive Ravi did not complete the training.

Step 3 — Conclusion: It follows validly.

Why other options are wrong:

- "Does not follow" / "probably false": the contrapositive is a valid deduction.
- "Data insufficient": the rule plus Ravi's status fully determine the answer.

Final Answer: The conclusion follows $\Rightarrow$ C

Answer: (C) Go Back to Q 19

Q20.

Solution

Concept — Coded inequalities: Chain the relations and check what is guaranteed.

Step 1 — Chain: $P > Q \geq R > S \geq T$.

Step 2 — From P to T: Reading the chain $P > Q \geq R > S \geq T$, every link keeps or increases the value as we move left, and there is at least one strict ">" ($P > Q$). So P is strictly greater than T.

Step 3 — Definite: $P > T$ is definitely true.

Why other options are wrong:

- $T \geq P$: contradicts $P > T$.
- $R < T$: but $R > S \geq T$ gives $R > T$, the opposite.

- $Q < S$: but $Q \geq R > S$ gives $Q > S$, the opposite.

Final Answer: $P > T \Rightarrow$ A

Answer: (A) Go Back to Q 20

Q21.

Solution

Concept — Ranking: Total = (position from left) + (position from right) -1.

Step 1 — Apply: Left position $= 11$, right position $= 19$.

Step 2 — Compute: Total $= 11 + 19 - 1 = 29$.

Why other options are wrong:

- 28: results from subtracting 2 instead of 1 $(11 + 19 - 2)$.
- 30: adds without subtracting the double-count $(11 + 19)$.
- 31: adds 1 instead of subtracting.

Final Answer: $11 + 19 - 1 = 29 \Rightarrow$ B

Answer: (B) Go Back to Q 21

Q22.

Solution

Concept — Calendar: Count days forward; 7 days = one full week (same weekday).

Step 1 — Days from 1 Jan to 1 Feb: January has 31 days, so 1 Feb is 31 days after 1 Jan.

Step 2 — Odd days: $31 \div 7 = 4$ remainder 3. So 1 Feb is 3 weekdays after Monday.

Step 3 — Count: Monday $+3$ = Tuesday, Wednesday, Thursday. So 1 Feb 2024 is a Thursday.

Why other options are wrong:

- Wednesday: that is $+2$ days, undercount by one.
- Friday: that is $+4$ days, overcount by one.
- Tuesday: that is $+1$ day only.

Final Answer: 1 Feb 2024 is Thursday $\Rightarrow$ B

Answer: (B) Go Back to Q 22

Q23.

Solution

Concept — Missing number: Detect the rule linking consecutive terms.

Step 1 — Test "$\times 2 + 1$": $4 \times 2 + 1 = 9$; $9 \times 2 + 1 = 19$; $19 \times 2 + 1 = 39$. The rule holds.

Step 2 — Next term: $39 \times 2 + 1 = 79$.

Step 3 — Verify last term: $79 \times 2 + 1 = 159$, which matches the given final term. So the missing number is 79.

Why other options are wrong:

- $69, 89, 99$: none satisfies $39 \times 2 + 1$ and also $\times 2 + 1 \to 159$.

Final Answer: $39 \times 2 + 1 = 79 \Rightarrow$ C

Answer: (C) Go Back to Q 23

Q24.

Solution

Concept — Data sufficiency: Test each statement for a unique answer.

Step 1 — Statement I alone: "Digit sum $= 9$" gives many two-digit numbers: $18, 27, 36, 45, 54, 63, 72, 81, 90$. Not unique. **Insufficient.**

Step 2 — Statement II alone: "Divisible by 9 and tens digit $= 4$." Two-digit multiples of 9 are $18, 27, 36, 45, 54, 63, 72, 81, 90$. Only 45 has tens digit 4. Unique $= 45$. **Sufficient.**

Step 3 — Conclusion: Statement II alone is sufficient; Statement I alone is not.

Why other options are wrong:

- "I alone": gives nine possibilities.
- "Both needed" / "Neither": II alone already pins down 45.

Final Answer: Statement II alone is sufficient $\Rightarrow$ C

Answer: (C) Go Back to Q 24

Q25.

Solution

Concept — Data sufficiency: Determine whether $x > y$ can be decided.

Step 1 — Statement I alone: $x + 5 = y + 8 \Rightarrow x = y + 3 \Rightarrow x - y = 3 > 0$. So $x > y$ is definitely true. **Sufficient.**

Step 2 — Statement II alone: "x, y positive integers" tells nothing about which is larger. **Insufficient.**

Step 3 — Conclusion: Statement I alone answers the question; II alone does not.

Why other options are wrong:

- "II alone": gives no ordering information.
- "Both needed" / "Neither": I alone already proves $x > y$.

Final Answer: Statement I alone is sufficient $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q 25

Q26.

Solution

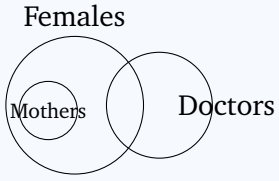
Concept — Logical Venn: Match the real-world relationship to the correct diagram.

Step 1 — Relationships: Every mother is a female, so Mothers $\subseteq$ Females (a circle fully inside). A doctor may or may not be a female, so Doctors partly overlaps Females.

Step 2 — Check diagrams:

- (A) three separate circles: wrong, since Mothers must be inside Females.
- (B) Mothers fully inside Females, Doctors overlapping Females: matches.
- (C) three concentric circles: wrongly forces all doctors to be mothers.
- (D) Doctors inside Mothers: wrongly forces every doctor to be a mother.

Step 3 — Correct figure:



Final Answer: Diagram (B) $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q 26

Q27.

Solution

Concept — DI (bar graph total): Read each bar value and add.

Step 1 — Values ('000 units): 2019=20, 2020=30, 2021=50, 2022=40, 2023=60.

Step 2 — Sum: $20 + 30 = 50$; $50 + 50 = 100$; $100 + 40 = 140$; $140 + 60 = 200$.

Step 3 — Total: 200 thousand units.

Why other options are wrong:

- $190, 210, 180$: arise from misreading one bar by 10.

Final Answer: Total $= 200 \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q 27

Q28.

Solution

Concept — DI (percentage change): % increase $= \dfrac{\text{new} - \text{old}}{\text{old}} \times 100$.

Step 1 — Values: $2020 = 30$, $2021 = 50$.

Step 2 — Compute: Increase $= 50 - 30 = 20$. $\% = \dfrac{20}{30} \times 100 = \dfrac{2000}{30} = 66.\overline{6}\%$.

Why other options are wrong:

- 40%: uses $\frac{20}{50}$ (divides by the new value).
- 50%: uses $\frac{20}{40}$, a wrong base.
- 60%: not produced by any correct base.

Final Answer: $\dfrac{20}{30} \times 100 = 66.\overline{6}\% \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q 28

Q29.

Solution

Concept — DI (ratio): Form the ratio and reduce.

Step 1 — Values: $2019 = 20$, $2022 = 40$.

Step 2 — Ratio: $20 : 40 = 1 : 2$ (divide both by 20).

Why other options are wrong:

- $2 : 3, 3 : 2$: do not reduce from $20 : 40$.
- $1 : 3$: would need 40 to be 3 times 20, but it is 2 times.

Final Answer: $20 : 40 = 1 : 2 \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q 29

Q30.

Solution

Concept — DI (average): Average $= \dfrac{\text{total}}{\text{number of years}}$.

Step 1 — Total: From Q27, total $= 200$ thousand units over 5 years.

Step 2 — Average: $\dfrac{200}{5} = 40$ thousand units.

Why other options are wrong:

- $42, 44, 38$: do not equal $\frac{200}{5}$.

Final Answer: $\dfrac{200}{5} = 40 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q 30

Q31.

Solution

Concept — Number series: Test a multiply-and-add rule between consecutive terms.

Step 1 — Test "$\times 2 + 1$": $5 \times 2 + 1 = 11$; $11 \times 2 + 1 = 23$; $23 \times 2 + 1 = 47$. The rule holds.

Step 2 — Next term: $47 \times 2 + 1 = 94 + 1 = 95$.

Why other options are wrong:

- 94: this is just 47×2, forgetting the "$+1$".
- $93, 96$: do not satisfy the $\times 2 + 1$ rule.

Final Answer: $47 \times 2 + 1 = 95 \Rightarrow$ C

Answer: (C) Go Back to Q 31

Q32.

Solution

Concept — Number series: Look at the differences between consecutive terms.

Step 1 — Differences: $6 - 2 = 4$; $12 - 6 = 6$; $20 - 12 = 8$; $30 - 20 = 10$.

Step 2 — Pattern: The differences are $4, 6, 8, 10$ (consecutive even numbers). The next difference is 12.

Step 3 — Next term: $30 + 12 = 42$.

Why other options are wrong:

- 40: would need a difference of 10, but the pattern advances to 12.
- $44, 46$: would need differences of 14 or 16, skipping 12.

Final Answer: $30 + 12 = 42 \Rightarrow$ B

Answer: (B) Go Back to Q 32

Q33.

Solution

Concept — Letter analogy: Find how the first group maps to the second.

Step 1 — First pair: $A(1) \to B(2)$, $C(3) \to D(4)$, $E(5) \to F(6)$. Each letter shifts forward by 1.

Step 2 — Apply to PRT: $P(16) \to Q(17)$; $R(18) \to S(19)$; $T(20) \to U(21)$. So $PRT \to QSU$.

Why other options are wrong:

- QSV: last letter should be $U(21)$, not $V(22)$.
- OQS: this shifts backward by 1, the wrong direction.

- QTV: middle/last letters are off by the wrong amounts.

Final Answer: $PRT \to QSU \Rightarrow$ A

Answer: (A) Go Back to Q 33

Q34.

Solution

Concept — Number analogy: Identify the rule linking 8 to 512.

Step 1 — Test rule: $8^3 = 8 \times 8 \times 8 = 512$. So the rule is "cube".

Step 2 — Apply: $6^3 = 6 \times 6 \times 6 = 216$.

Why other options are wrong:

- $144 = 12^2$: uses squaring of 12, not the cube rule.
- $196 = 14^2$: also a square, not a cube.
- 232: not a perfect cube at all.

Final Answer: $6^3 = 216 \Rightarrow$ B

Answer: (B) Go Back to Q 34

Q35.

Solution

Concept — Classification: Find the common property shared by four of the five numbers.

Step 1 — Check primes: $13, 17, 19, 23$ are all prime numbers (divisible only by 1 and themselves).

Step 2 — Odd one out: $21 = 3 \times 7$ is composite, so it is not prime.

Why other options are wrong:

- $13, 17, 19$: all prime, so they belong to the group.

Final Answer: 21 is not prime $\Rightarrow$ D

Answer: (D) Go Back to Q 35

Q36.

Solution

Concept — Coding (letter shift): Compare the code with the original to find the shift.

Step 1 — Find rule from FROST → HTQUV: $F(6) \to H(8)$ is $+2$; $R(18) \to T(20)$ is $+2$; $O(15) \to Q(17)$ is $+2$; $S(19) \to U(21)$ is $+2$; $T(20) \to V(22)$ is $+2$. Each letter shifts forward by 2.

Step 2 — Apply to CLOUD: $C(3) \to E(5)$; $L(12) \to N(14)$; $O(15) \to Q(17)$; $U(21) \to W(23)$; $D(4) \to F(6)$.

Step 3 — Code: $ENQWF$.

Why other options are wrong:

- $DMPVE$: this is a $+1$ shift, not $+2$.
- $ENRWF$: third letter should be $Q(17)$, not $R(18)$.
- $ENQVF$: fourth letter should be $W(23)$, not $V(22)$.

Final Answer: CLOUD $\to ENQWF \Rightarrow$ A

Answer: (A) Go Back to Q 36

Q37.

Solution

Concept — Number coding: Each word's code is the sum of its letters' positions ($A = 1, B = 2, \ldots$).

Step 1 — Verify rule: CAB $= C(3) + A(1) + B(2) = 6$. ✓ BED $= B(2) + E(5) + D(4) = 11$. ✓

Step 2 — Apply to FED: $F(6) + E(5) + D(4) = 15$.

Why other options are wrong:

- $13, 14$: undercount one or more letter values.
- 16: overcounts by 1.

Final Answer: $6 + 5 + 4 = 15 \Rightarrow$ C

Answer: (C) Go Back to Q 37

Q38.

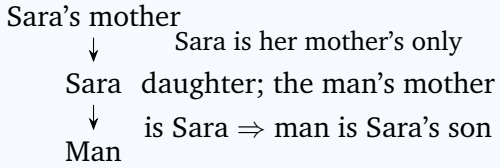
Solution

Concept — Blood relations: Decode the statement, then draw a family tree.

Step 1 — "The only daughter of my mother": Sara's mother has only one daughter, which must be Sara herself.

Step 2 — "His mother is . . . Sara": So the man's mother is Sara. Therefore the man is Sara's son.

Family tree:



Why other options are wrong:

- Brother: would require the man and Sara to share a parent, which is not stated.
- Uncle / Nephew: belong to other generations; the man is one generation below Sara.

Final Answer: The man is Sara's son ⇒ $\boxed{\text{D}}$

Answer: (D) Go Back to Q 38

Q39.

Solution

Concept — Coded relations: M is the daughter of N means N is M's parent and M is female.

Step 1 — Test option (B) $N \div M \times P$: $N \div M$ means N is the father of M; $M \times P$ means M is the sister of P. "Sister" makes M female, and N being her father makes M the daughter of N. Correct.

Step 2 — Reject others:

- (A) $M \times P \div N$: M is sister of P, P is father of $N \Rightarrow M$ is N's aunt, not daughter.
- (C) $N + P \div M$: N is wife of P, P is father of $M \Rightarrow$ relates P to M, and M's sex is unknown.

- (D) $M + P \times N$: M is wife of $P \Rightarrow M$ is married, not shown as N's daughter.

Final Answer: $N \div M \times P$ gives the daughter relation $\Rightarrow$ B

Answer: (B) Go Back to Q 39

Q40.

Solution

Concept — Direction sense (Pythagoras): The two legs are perpendicular, so the straight-line distance is the hypotenuse.

Step 1 — Legs: South leg $= 6$ km, East leg $= 8$ km, and these directions are at right angles.

Step 2 — Hypotenuse: Distance $= \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$ km.

Why other options are wrong:

- 14 km: this is $6 + 8$, the path length, not the straight-line distance.
- $12, 11$ km: do not satisfy $\sqrt{6^2 + 8^2}$.

Final Answer: $\sqrt{36 + 64} = 10$ km $\Rightarrow$ C

Answer: (C) Go Back to Q 40

Q41.

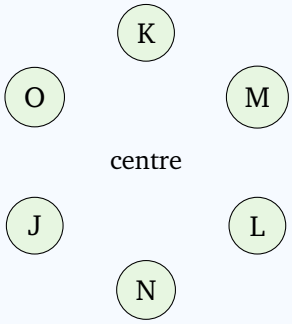
Solution

Concept — Circular seating: Place people one clue at a time around the table (all facing the centre, so each person's right is clockwise).

Step 1 — Anchor K: Put K at the top. "M immediate right of K" places M one seat clockwise; "O immediate left of K" places O one seat anticlockwise.

Step 2 — Place L, N, J: "L between M and N" puts L next to M (clockwise) with N on L's other side. "J immediate right of N" puts J clockwise of N. The full clockwise order becomes K, M, L, N, J, O.

Final arrangement:



Step 3 — Opposite K: In a 6-seat circle, opposite means three seats away. Three seats clockwise from K ($\rightarrow M \rightarrow L \rightarrow N$) lands on N.

Why other options are wrong:

- J, L, M: none is diametrically opposite K; only N is three seats away.

Final Answer: Opposite K is $N \Rightarrow$ C

Answer: (C) Go Back to Q 41

Q42.

Solution

Concept — Circular seating: Use the order found in Q41: clockwise K, M, L, N, J, O.

Step 1 — Locate N: N is the fourth seat clockwise from K.

Step 2 — Immediate right of N: Right means one seat clockwise from N, which is J.

Why other options are wrong:

- K, M, O: none sits immediately clockwise of N; only J does.

Final Answer: Immediate right of N is $J \Rightarrow$ C

Answer: (C) Go Back to Q 42

Q43.

Solution

Concept — Circular seating: Read the neighbours of L from the order K, M, L, N, J, O.

Step 1 — Neighbours of L: The seat anticlockwise of L is M, and the seat clockwise of L is N.

Step 2 — Pair: So L's immediate neighbours are M and N.

Why other options are wrong:

- J and K, K and O, O and N: none of these pairs flanks L in the arrangement.

Final Answer: Neighbours of L are M and $N \Rightarrow$ A

Answer: (A) Go Back to Q 43

Q44.

Solution

Concept — Ordering puzzle: Combine the comparisons into a single height order.

Step 1 — Use clues: $R > Q$ and $R < S$ give $S > R > Q$. T is shortest. $P > S$.

Step 2 — Full order (tallest to shortest): $P > S > R > Q > T$.

Step 3 — Second tallest: The second position from the top is S.

Why other options are wrong:

- P: is the tallest, not second.
- R: is third tallest.
- Q: is fourth tallest.

Final Answer: Second tallest is $S \Rightarrow$ C

Answer: (C) Go Back to Q 44

Q45.

Solution

Concept — Floor puzzle: Place each person from the clues, then find the empty floor.

Step 1 — Fixed clues: W = floor 4. "Y immediately below W" $\Rightarrow$ Y = floor 3. "X on topmost floor" $\Rightarrow$ X = floor 5.

Step 2 — Place Z: Z is on an even floor. Even floors are 2 and 4; floor 4 is taken by W, so Z = floor 2.

Step 3 — Vacant floor: Occupied floors are $5(X), 4(W), 3(Y), 2(Z)$. Floor 1 is left empty.

Why other options are wrong:

- Floor 2: occupied by Z.
- Floor 3: occupied by Y.
- Floor 5: occupied by X.

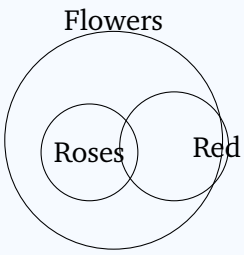
Final Answer: Floor 1 is vacant $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q 45

Q46.

Solution

Concept — Syllogism: "All roses are flowers" and "Some flowers are red."



Roses $\subseteq$ Flowers; Red overlaps Flowers (not necessarily Roses)

Step 1 — Conclusion I (Some roses are red): The red region overlaps Flowers but need not touch the Roses circle, so this is not guaranteed. **Does not follow.**

Step 2 — Conclusion II (Some flowers are roses): Since all roses are flowers and roses exist, those roses are flowers, so some flowers are roses. **Follows.**

Why other options are wrong:

- "Only I" / "Both": I is not guaranteed, so any choice with I fails.
- "Neither": II is valid, so this is wrong.

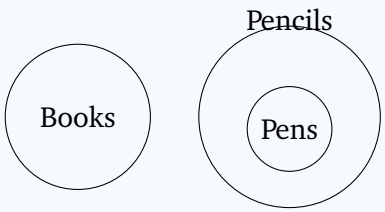
Final Answer: Only II follows $\Rightarrow$ A

Answer: (A) Go Back to Q 46

Q47.

Solution

Concept — Syllogism: "No book is a pen" and "All pens are pencils."



Pens $\subseteq$ Pencils; Books $\cap$ Pens $= \varnothing$

Step 1 — Conclusion I (Some pencils are not books): Pens are pencils, and no pen is a book, so those pens (which are pencils) are not books. Hence some pencils are not books. **Follows.**

Step 2 — Conclusion II (No book is a pencil): Books are only barred from being pens, not from being pencils; a book could still be a pencil. **Does not follow.**

Why other options are wrong:

- "Only II" / "Both": II is not guaranteed.
- "Neither": I is valid, so this is wrong.

Final Answer: Only I follows $\Rightarrow$ C

Answer: (C) Go Back to Q 47

Q48.

Solution

Concept — Statement & Assumption: An implicit assumption is something the advertisement takes for granted.

Step 1 — Assumption I: The pitch "stay healthy" only appeals if people care about their health, so this is assumed. **Implicit.**

Step 2 — Assumption II: Linking the purifier to staying healthy presumes it actually improves the water. **Implicit.**

Step 3 — Both: Both I and II underlie the advertisement.

Why other options are wrong:

- "Only I" / "Only II": each omits a genuine assumption.
- "Neither": both are clearly assumed.

Final Answer: Both I and II are implicit $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q 48

Q49.

Solution

Concept — Statement & Conclusion (invalid converse): "Scored above 90% $\Rightarrow$ scholarship" does not work in reverse.

Step 1 — Direction of the rule: The statement guarantees only that high scorers get a scholarship. It does not say scholarships are given *only* to high scorers.

Step 2 — Apply to Neha: Neha received a scholarship, but she might have got it for another reason. We cannot conclude she scored above 90%.

Step 3 — Verdict: The conclusion is the converse of the rule and does not follow.

Why other options are wrong:

- "Follows" / "certainly true": assume the invalid converse.
- "Contrapositive": the contrapositive would be "no scholarship $\Rightarrow$ not above 90%," which is different.

Final Answer: The conclusion does not follow $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q 49

Q50.

Solution

Concept — Coded inequalities: Chain the relations and check what is guaranteed.

Step 1 — Chain: $A \geq B > C \geq D > E$.

Step 2 — From A to E: Moving along $A \geq B > C \geq D > E$, the value never increases as we go right, and there are strict ">" links ($B > C$ and $D > E$). So A is strictly greater than E.

Step 3 — Definite: $A > E$ is definitely true.

Why other options are wrong:

- $E \geq A$: contradicts $A > E$.
- $C < E$: but $C \geq D > E$ gives $C > E$, the opposite.
- $B \leq D$: but $B > C \geq D$ gives $B > D$, the opposite.

Final Answer: $A > E \Rightarrow$ A

Answer: (A) Go Back to Q 50

Q51.

Solution

Concept — Ranking: Total = (rank from top) + (rank from bottom) -1.

Step 1 — Apply: Rank from top $= 7$, rank from bottom $= 26$.

Step 2 — Compute: Total $= 7 + 26 - 1 = 32$.

Why other options are wrong:

- 33: adds without removing the double-count $(7 + 26)$.
- 31: subtracts 2 instead of 1.
- 34: adds 1 instead of subtracting.

Final Answer: $7 + 26 - 1 = 32 \Rightarrow$ D

Answer: (D) Go Back to Q 51

Q52.

Solution

Concept — Clock angles: The minute hand sweeps a full 360° in 60 minutes.

Step 1 — Rate: $\dfrac{360^\circ}{60 \text{ min}} = 6^\circ$ per minute.

Step 2 — For 20 minutes: $6^\circ \times 20 = 120^\circ$.

Why other options are wrong:

- 100°: uses 5° per minute, the hour-hand-style rate.
- 90°: corresponds to 15 minutes, not 20.
- 150°: corresponds to 25 minutes.

Final Answer: $6^\circ \times 20 = 120^\circ \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q 52

Q53.

Solution

Concept — Missing number: Check whether each term is a fixed multiple of the previous one.

Step 1 — Test "$\times 2$": $7 \times 2 = 14$; $14 \times 2 = 28$. The terms double each time.

Step 2 — Missing term: $28 \times 2 = 56$.

Step 3 — Verify: $56 \times 2 = 112$, which matches the given last term.

Why other options are wrong:

- 42: this is $28 + 14$ (a wrong additive guess); $42 \times 2 = 84 \neq 112$.
- $48, 64$: do not satisfy 28×2 and lead-on to 112.

Final Answer: $28 \times 2 = 56 \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q 53

Q54.

Solution

Concept — Data sufficiency: Test whether each statement pins down Ramesh's present age.

Step 1 — Statement I alone: The son is now 15, so five years ago he was 10. Then Ramesh was $3 \times 10 = 30$, so Ramesh is now $30 + 5 = 35$. Unique value. **Sufficient.**

Step 2 — Statement II alone: "Ramesh is older than his son" gives no number for his age. **Insufficient.**

Step 3 — Conclusion: Statement I alone is sufficient; II alone is not.

Why other options are wrong:

- "II alone": gives no exact age.
- "Both needed" / "Neither": I alone already fixes the age at 35.

Final Answer: Statement I alone is sufficient $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q 54

Q55.

Solution

Concept — Data sufficiency: Check whether each statement alone settles whether n is even.

Step 1 — Statement I alone: $n + 3$ is odd $\Rightarrow$ n is odd-minus-odd $=$ even. (Odd $-$ odd $=$ even.) So n is even. **Sufficient.**

Step 2 — Statement II alone: $2n$ divisible by $4 \Rightarrow \dfrac{2n}{4} = \dfrac{n}{2}$ is an integer $\Rightarrow$ n is even. **Sufficient.**

Step 3 — Conclusion: Each statement alone determines that n is even.

Why other options are wrong:

- "I alone only" / "II alone only": understates the other statement, which is also sufficient.
- "Neither": both clearly work.

Final Answer: Either statement alone is sufficient $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q 55

Q56.

Solution

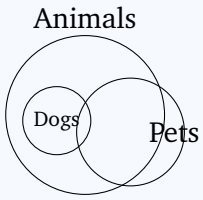
Concept — Logical Venn: Translate each relationship into circle placement.

Step 1 — Relationships: Every dog is an animal, so Dogs $\subseteq$ Animals (a circle fully inside). Some dogs are pets and some pets are non-dog animals, so Pets overlaps both Dogs and Animals without being contained in either.

Step 2 — Check diagrams:

- (A) three separate circles: wrong, since Dogs must lie inside Animals.
- (B) three concentric circles: wrongly forces all pets to be dogs and all dogs to be pets.
- (C) Dogs inside Pets inside Animals: wrongly forces every dog to be a pet.
- (D) Dogs inside Animals, Pets overlapping both: matches.

Step 3 — Correct figure:



Final Answer: Diagram (D) $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q 56

Q57.

Solution

Concept — DI (table total): Read the 2023 column and add all four categories.

Step 1 — 2023 values (hundreds): Fiction $= 40$, Science $= 35$, History $= 25$, Comics $= 20$.

Step 2 — Sum: $40 + 35 = 75$; $75 + 25 = 100$; $100 + 20 = 120$.

Step 3 — Total: 120 (hundreds).

Why other options are wrong:

- 90: this is the 2022 total, not 2023.
- 110, 130: arise from misreading one entry by 10.

Final Answer: Total $= 120 \Rightarrow \boxed{B}$

Answer: (B) Go Back to Q 57

Q58.

Solution

Concept — DI (largest increase): Compute each category's $2023 - 2022$ change.

Step 1 — Increases (hundreds): Fiction $= 40 - 30 = 10$; Science $= 35 - 20 = 15$; History $= 25 - 25 = 0$; Comics $= 20 - 15 = 5$.

Step 2 — Largest: The biggest rise is 15, for Science.

Why other options are wrong:

- Fiction: rose by 10, less than Science's 15.
- Comics: rose by only 5.
- History: stayed the same (0 increase).

Final Answer: Science had the largest increase $\Rightarrow \boxed{A}$

Answer: (A) Go Back to Q 58

Q59.

Solution

Concept — DI (ratio): Form the ratio and reduce it.

Step 1 — Values: Fiction in $2022 = 30$; Science in $2023 = 35$.

Step 2 — Ratio: $30 : 35$. Divide both by 5: $6 : 7$.

Why other options are wrong:

- $7 : 6$: reverses the two quantities.
- $3 : 4, 4 : 3$: do not reduce from $30 : 35$.

Final Answer: $30 : 35 = 6 : 7 \Rightarrow \boxed{B}$

Answer: (B) Go Back to Q 59

Q60.

Solution

Concept — DI (percentage difference): Find both yearly totals, then express the gap as a percentage of the 2023 total.

Step 1 — 2022 total: $30 + 20 + 25 + 15 = 90$ (hundreds).

Step 2 — 2023 total: From Q57, 120 (hundreds).

Step 3 — Difference: $120 - 90 = 30$ (hundreds).

Step 4 — As a percentage of 2023: $\dfrac{30}{120} \times 100 = 25\%$.

Why other options are wrong:

- 33%: uses $\frac{30}{90}$ (the 2022 base), not the 2023 base.
- $20\%, 30\%$: do not equal $\frac{30}{120} \times 100$.

Final Answer: $\dfrac{30}{120} \times 100 = 25\% \Rightarrow \boxed{C}$

Answer: (C) Go Back to Q 60

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	B	3	B	4	A	5	C
6	D	7	A	8	C	9	B	10	C
11	D	12	B	13	A	14	B	15	D
16	A	17	D	18	B	19	C	20	A
21	B	22	B	23	C	24	C	25	D
26	B	27	B	28	A	29	C	30	D
31	C	32	B	33	A	34	B	35	D
36	A	37	C	38	D	39	B	40	C
41	C	42	C	43	A	44	C	45	A
46	A	47	C	48	D	49	B	50	A
51	D	52	C	53	B	54	A	55	C
56	D	57	B	58	A	59	B	60	C