TALLENTEX Mental Ability

Sample Paper – 9

Duration: 30 Minutes **Maximum Marks: 80**

Instructions

- This paper contains **20** Multiple Choice Questions (Single Correct Answer) modelled on the Mental Ability (IQ) section of **TALLENTEX**.
- Each correct answer carries **+4 marks**. There is **−1 mark** for each incorrect answer. Unattempted questions carry no marks.
- Only **one** option is correct per question. Choose carefully.
- Use of mobile phones, calculators, or any electronic devices is strictly prohibited.
- Mark your answers on the OMR sheet with a black/blue ball-point pen only.

Q1. Find the missing number in the following series:

2, 4, 12, 48, 240, ?

(A) 960

(B) 1080

(C) 1200

(D) 1440

Q2. Find the missing number in the following series:

5, 9, 15, 23, 33, ?

(A) 45

(B) 41

(C) 43

(D) 47

Q3. Find the missing letter in the following series:

Z, W, T, Q, N, ?

(A) J

(B) K

(C) L

(D) M

Q4. Complete the analogy:

Pen : Writer :: Chisel : ?

(A) Artist

(B) Painter

(C) Sculptor

(D) Carpenter

Q5. Study the relationship: $(3,\ 5) \rightarrow 34$; $(4,\ 6) \rightarrow 52$.

Using the same rule, find the value for $(2,\ 7)$.

(A) 45

(B) 49

(C) 51

(D) 53

Q6. In a code language, each letter is replaced by its **mirror letter** in the alphabet (A↔Z, B↔Y, C↔X, . . . , M↔N).

Using this rule, how is **BIRD** coded?

(A) YRIW

(B) RYWI

(C) BIRW

(D) YWRI

Q7. In a code language, each letter is shifted **3 places forward** in the alphabet (A→D, B→E, . . . , W→Z, X→A, Y→B, Z→C).

What is the code for **DOG**?

(A) FQI

(B) GRJ

(C) HRK

(D) FRJ

Q8. Reena's father is Sunil. Sunil's only sister is Kavita.

How is **Kavita** related to **Reena**?

(A) Mother

(B) Sister

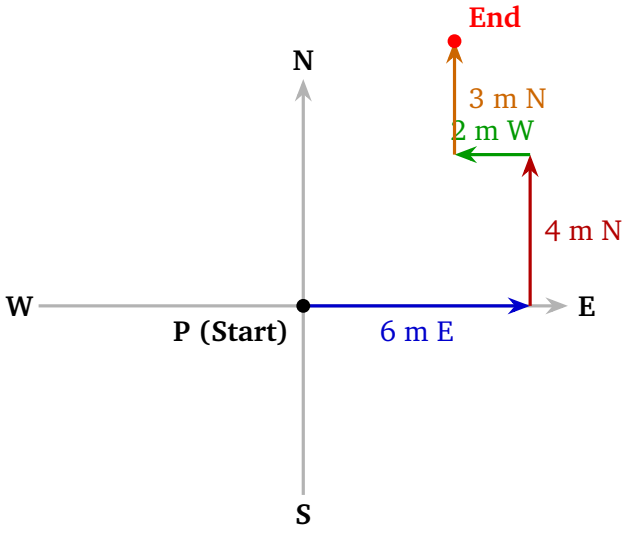
(C) Aunt

(D) Grandmother

Q9. Riya starts at point **P** facing **East** and makes the following moves:

- Walks **6 m East**
- Turns left and walks **4 m North**
- Turns left and walks **2 m West**
- Turns right and walks **3 m North**

In which direction from **P** is Riya now?



(A) North

(B) East

(C) North-West

(D) North-East

Q10. A person initially faces **South**. He then turns **90° anti-clockwise**, followed by **180° clockwise**, and finally **90° clockwise**. In which direction does he face at the end?

(A) North

(B) South

(C) East

(D) West

Q11. Four of the following five are alike in a certain way. Find the one that does **NOT** belong to the group.

Mercury, Venus, Earth, Moon, Mars

(A) Mercury

(B) Moon

(C) Venus

(D) Mars

Q12. Find the word that does **NOT** belong to the group:

Rose, Jasmine, Lotus, Mango, Marigold

(A) Rose

(B) Jasmine

(C) Mango

(D) Marigold

Q13. Given the following information:

- Priya is **taller** than Qian but **shorter** than Ram.
- Sita is **shorter** than Qian but **taller** than Tina.

Who is the **third tallest** among the five?

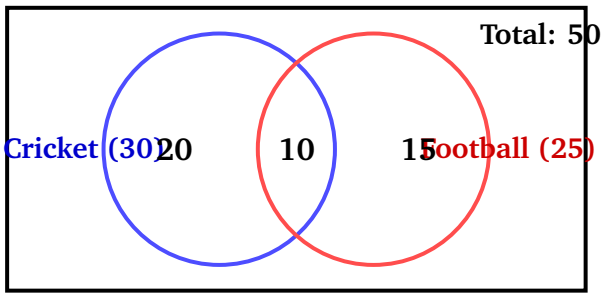
(A) Qian

(B) Priya

(C) Ram

(D) Sita

Q14. In a group of **50** people: 30 like **Cricket**, 25 like **Football**, and **10** like both.



How many people like **neither** sport?

(A) 10

(B) 3

(C) 7

(D) 5

Q15. In the table below, each row follows the rule: **Col 1** $\times$ **Col 2** $=$ **Col 3**. Find the missing number **(?)**.

Col 1	Col 2	Col 3
3	5	15
4	6	24
7	?	28

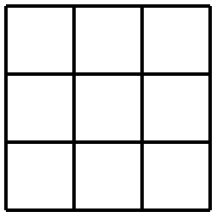
(A) 5

(B) 4

(C) 6

(D) 3

Q16. How many **squares** (of all sizes) are there in the figure below?



Count all squares of every size: 1×1, 2×2, *and* 3×3.

(A) 9

(B) 12

(C) 14

(D) 16

Q17. Study the pattern in the table and find the number that replaces **(?)**.

2	6	18
3	9	27
4	12	?

In each row: 2nd number = 1st number $\times 3$; 3rd number = 2nd number $\times 3$.

(A) 36

(B) 30

(C) 48

(D) 24

Q18. A custom operation is defined as:

$$a \bigstar b = a^2 - ab + b$$

Find the value of $5 \bigstar 3$.

(A) 7

(B) 10

(C) 15

(D) 13

Q19. Five friends — Ela, Anil, Bina, Charu, and Dev — sit in a row.

- Anil sits **immediately to the left** of Bina.
- Charu sits **immediately to the right** of Bina.
- Dev sits **to the right** of Charu.
- Ela sits **to the left** of Anil.

Who sits in the **middle** (position 3)?

(A) Anil

(B) Bina

(C) Charu

(D) Dev

Q20. Statements:

I. All books are novels.

II. Some novels are interesting.

Conclusions:

I. All novels are books.

II. Some books are interesting.

III. Some interesting things are novels.

IV. All interesting things are novels.

Which conclusion **definitely follows**?

(A) Only I

(B) Only II

(C) Only III

(D) Both I and II

Detailed Solutions

Q1.

Solution

Concept: Number series with successive multiplication.

Step 1 – Identify the multipliers between consecutive terms:

$4 \div 2 = 2$; $12 \div 4 = 3$; $48 \div 12 = 4$; $240 \div 48 = 5$.

The multipliers are $\times 2, \times 3, \times 4, \times 5, \ldots$ (increasing by 1 each step).

Step 2 – Find the next term:

Next multiplier $= 6$. Missing number $= 240 \times 6 = \mathbf{1440}$.

Why other options are wrong:

(A) 960: 240×4 – uses the multiplier from two steps back.

(B) 1080: not a whole-number multiple of 240 by the pattern.

(C) 1200: 240×5 – uses the previous step's multiplier (5) again instead of advancing to 6.

Answer: (D) Go Back to Q1

Q2.

Solution

Concept: Number series with increasing even differences.

Step 1 – Compute differences between consecutive terms:

$9 - 5 = 4$; $15 - 9 = 6$; $23 - 15 = 8$; $33 - 23 = 10$.

Differences: $4, 6, 8, 10, \ldots$ (each difference increases by 2).

Step 2 – Find the next difference and the missing term:

Next difference $= 12$. Missing number $= 33 + 12 = \mathbf{45}$.

Why other options are wrong:

(B) 41: $33 + 8$ – reuses the difference from two steps back.

(C) 43: $33 + 10$ – reuses the immediately preceding difference (10) instead of advancing to 12.

(D) 47: $33 + 14$ – advances the difference by 4 instead of 2.

Answer: (A) Go Back to Q2

Q3.

Solution

Concept: Letter series with constant backward step of -3.

Step 1 – Assign alphabetical positions:
Z $= 26$, W $= 23$, T $= 20$, Q $= 17$, N $= 14$.

Step 2 – Identify the pattern and find the next term:
Each term decreases by 3 positions: $14 - 3 = 11$. The 11th letter is **K**.

Why other options are wrong:
(A) J: 10th letter (step of -4, not -3).
(C) L: 12th letter (step of -2, not -3).
(D) M: 13th letter (step of -1, not -3).

Answer: (B) Go Back to Q3

Q4.

Solution

Concept: Word analogy – tool and the professional who uses it as a primary instrument.

Step 1 – Understand the relationship:
A **Pen** is the primary/defining tool of a **Writer**.

Step 2 – Apply to Chisel:
A **Chisel** is the primary/defining tool of a **Sculptor** (used to carve stone, wood, or metal into sculptures).

Why other options are wrong:
(A) Artist: too general; an artist can use brushes, pens, or many other tools – not specifically a chisel.
(B) Painter: a painter's primary tool is a brush, not a chisel.
(D) Carpenter: a carpenter uses chisels occasionally, but the primary/defining analogy belongs to the sculptor.

Answer: (C) Go Back to Q4

Q5.

Solution

Concept: Number analogy using the rule $(a, b) \to a^2 + b^2$.

Step 1 – Verify with given pairs:
$(3, 5)$: $3^2 + 5^2 = 9 + 25 = 34$. ✓
$(4, 6)$: $4^2 + 6^2 = 16 + 36 = 52$. ✓

Step 2 – Apply to $(2, 7)$:
$2^2 + 7^2 = 4 + 49 = \mathbf{53}$.

Why other options are wrong:
(A) 45: no standard combination of 2 and 7 squares yields 45.
(B) 49: $7^2 = 49$ – ignores the 2^2 term entirely.
(C) 51: arithmetic slip ($4 + 47$ or similar); $7^2 = 49$, not 47.

Answer: (D) Go Back to Q5

Q6.

Solution

Concept: Coding-Decoding – mirror letter (position n maps to position $27 - n$).

Step 1 – Apply the mirror rule to each letter of BIRD:
B (position 2) $\to$ position $27 - 2 = 25 =$ Y.
I (position 9) $\to$ position $27 - 9 = 18 =$ R.
R (position 18) $\to$ position $27 - 18 = 9 =$ I.
D (position 4) $\to$ position $27 - 4 = 23 =$ W.

Result: YRIW.

Why other options are wrong:
(B) RYWI: incorrect order – swaps B$\to$R and I$\to$Y among other errors.
(C) BIRW: applies the transform only to D (D$\to$W) while leaving the other letters unchanged.
(D) YWRI: transposes the positions of R and I in the coded output.

Answer: (A) Go Back to Q6

Q7.

Solution

Concept: Coding-Decoding – each letter shifted forward by 3 positions in the alphabet.

Step 1 – Apply the shift to each letter of DOG:
D (position 4) $+3 = 7 =$ G.
O (position 15) $+3 = 18 =$ R.
G (position 7) $+3 = 10 =$ J.

Result: GRJ.

Why other options are wrong:
(A) FQI: D$\rightarrow$F is a shift of $+2$; O$\rightarrow$Q is also $+2$; inconsistent shifts.
(C) HRK: D$\rightarrow$H is a shift of $+4$; inconsistent application.
(D) FRJ: D$\rightarrow$F is only $+2$ while O and G are shifted correctly by $+3$; inconsistent.

Answer: (B) Go Back to Q7

Q8.

Solution

Concept: Blood Relations – two-step family chain.

Step 1 – Parse the given information:
Reena's father $=$ Sunil.
Sunil's only sister $=$ Kavita.

Step 2 – Determine the relationship:
Kavita is the sister of Reena's father (Sunil).
$\Rightarrow$ Kavita is Reena's **paternal aunt**.

Why other options are wrong:
(A) Mother: Reena's mother would be Sunil's wife, not his sister.
(B) Sister: Reena's sister would share the same parents; Kavita belongs to the parent's generation.
(D) Grandmother: Reena's grandmother would be Sunil's mother, one generation above Sunil.

Answer: (C) Go Back to Q8

Q9.

Solution

Concept: Direction Sense – tracking coordinates after a multi-step journey.

Step 1 – Track position and facing direction from P $= (0, 0)$, initially facing East:

Walk 6 m East: reach $(6, 0)$; still facing East.

Turn left (now facing **North**), walk 4 m: reach $(6, 4)$.

Turn left (now facing **West**), walk 2 m: reach $(4, 4)$.

Turn right (now facing **North**), walk 3 m: reach $(4, 7)$.

Step 2 – Find direction from P:

End point $(4, 7)$: $x = 4 > 0$ (East of P) and $y = 7 > 0$ (North of P).

$\Rightarrow$ Riya is to the **North-East** of P.

Why other options are wrong:

(A) North: Riya is also 4 m to the East, so it is not purely North.

(B) East: Riya is also 7 m to the North, so it is not purely East.

(C) North-West: Riya moved net 4 m East (positive x), not West.

Answer: (D) Go Back to Q9

Q10.

Solution

Concept: Direction Sense – tracking facing direction using compass bearing arithmetic.

Step 1 – Apply each turn in sequence:

Initial facing: **South** (bearing $180°$).

Turn $90°$ anti-clockwise: $180° - 90° = 90° =$ **East**.

Turn $180°$ clockwise: $90° + 180° = 270° =$ **West**.

Turn $90°$ clockwise: $270° + 90° = 360° = 0° =$ **North**.

Final direction: North.

Why other options are wrong:

(B) South: would be the result with no net turns (all turns cancel); they do not cancel here.

(C) East: direction after only the first turn ($90°$ anti-clockwise).

(D) West: direction after the first two turns, before the final $90°$ clockwise is applied.

Answer: (A) Go Back to Q10

Q11.

Solution

Concept: Classification – Odd One Out (planets vs. natural satellite).

Step 1 – Classify each body:
Mercury – planet (orbits the Sun directly).
Venus – planet (orbits the Sun directly).
Earth – planet (orbits the Sun directly).
Mars – planet (orbits the Sun directly).
Moon – natural satellite (orbits Earth, not the Sun directly).

Step 2 – Identify the odd one:
All others are planets of the Solar System. The Moon is Earth's natural satellite.

Why other options are wrong:
(A) Mercury, (C) Venus, (D) Mars: all are planets orbiting the Sun.

Answer: (B) Go Back to Q11

Q12.

Solution

Concept: Classification – Odd One Out (flowers vs. fruit/fruit-bearing tree).

Step 1 – Classify each word:
Rose – flower.
Jasmine – flower.
Lotus – flower.
Marigold – flower.
Mango – fruit (and the tree bearing it); not a flower.

Step 2 – Identify the odd one:
All others are flowers. Mango is a fruit/fruit-bearing tree and does not belong.

Why other options are wrong:
(A) Rose, (B) Jasmine, (D) Marigold: all are flowering plants/flowers.

Answer: (C) Go Back to Q12

Q13.

Solution

Concept: Ranking – combining two inequality chains into a single ordering.

Step 1 – Extract inequalities from the clues:
Clue 1: Qian $<$ Priya $<$ Ram (tallest to shortest: Ram $>$ Priya $>$ Qian).
Clue 2: Tina $<$ Sita $<$ Qian (Qian $>$ Sita $>$ Tina).

Step 2 – Combine into a single order (tallest $\rightarrow$ shortest):
Ram $>$ Priya $>$ Qian $>$ Sita $>$ Tina.

Step 3 – Identify the 3rd tallest:
1st: Ram, 2nd: Priya, **3rd: Qian**, 4th: Sita, 5th: Tina.

Why other options are wrong:
(B) Priya: 2nd tallest.
(C) Ram: 1st (tallest).
(D) Sita: 4th tallest.

Answer: (A) Go Back to Q13

Q14.

Solution

Concept: Venn Diagram – two overlapping sets; finding the "neither" region.

Step 1 – Apply the inclusion-exclusion principle:
$|\text{Cricket} \cup \text{Football}| = |\text{Cricket}| + |\text{Football}| - |\text{Cricket} \cap \text{Football}|$
$= 30 + 25 - 10 = 45.$

Step 2 – Find those who like neither:
Neither $=$ Total $- |\text{Cricket} \cup \text{Football}| = 50 - 45 = \mathbf{5}.$

Why other options are wrong:
(A) 10: this is the count of people who like *both* sports, not neither.
(B) 3: no basis from the given data.
(C) 7: off by 2; $50 - 43 = 7$ would require $|C \cup F| = 43$, which is incorrect.

Answer: (D) Go Back to Q14

Q15.

Solution

Concept: Missing Number – each row satisfies Col 1 $\times$ Col 2 $=$ Col 3.

Step 1 – Verify the rule with the first two rows:

Row 1: $3 \times 5 = 15$. ✓

Row 2: $4 \times 6 = 24$. ✓

Step 2 – Apply the rule to Row 3:

$7 \times ? = 28 \Rightarrow ? = 28 \div 7 = \mathbf{4}$.

Why other options are wrong:

(A) 5: $7 \times 5 = 35 \neq 28$.

(C) 6: $7 \times 6 = 42 \neq 28$.

(D) 3: $7 \times 3 = 21 \neq 28$.

Answer: (B) Go Back to Q15

Q16.

Solution

Concept: Counting Squares by size in a 3×3 grid.

Step 1 – Count squares of each size:

1×1 squares: In a 3×3 grid there are $3^2 = 9$ unit squares.

2×2 squares: Starting positions limited to a 2×2 array of top-left corners $\Rightarrow 2^2 = 4$ squares.

3×3 squares: Only $1^2 = 1$ such square (the entire grid).

Step 2 – Sum all sizes:

Total $= 9 + 4 + 1 = \mathbf{14}$.

Why other options are wrong:

(A) 9: counts only 1×1 squares, ignoring larger sizes.

(B) 12: incorrect count for 2×2 squares (uses 3 instead of 4), giving $9+3+1 = 13$... or similar off-by-two error.

(D) 16: the formula $n^2(n+1)^2/4$ applies to a 4×4 grid ($n = 4$ gives $16+9+4+1 = 30$); 16 is only the 1×1 count for a 4×4 grid.

Answer: (C) Go Back to Q16

Q17.

Solution

Concept: Pattern Matrix – each row follows the rule: 2nd $=$ 1st $\times 3$; 3rd $=$ 2nd $\times 3$.

Step 1 – Verify the rule with Rows 1 and 2:
Row 1: $2,\ 2 \times 3 = 6,\ 6 \times 3 = 18$. ✓
Row 2: $3,\ 3 \times 3 = 9,\ 9 \times 3 = 27$. ✓

Step 2 – Apply to Row 3:
Row 3: $4,\ 4 \times 3 = 12,\ 12 \times 3 =$ **36**.

Why other options are wrong:
(B) 30: $10 \times 3 = 30$ – uses an incorrect 2nd element (10 instead of 12).
(C) 48: $16 \times 3 = 48$ – uses an incorrect 2nd element (16 instead of 12).
(D) 24: $8 \times 3 = 24$ – uses an incorrect 2nd element (8 instead of 12).

Answer: (A) Go Back to Q17

Q18.

Solution

Concept: Custom operator – evaluate $a \bigstar b = a^2 - ab + b$ step by step.

Step 1 – Substitute $a = 5$ and $b = 3$:
$5 \bigstar 3 = 5^2 - (5 \times 3) + 3 = 25 - 15 + 3 =$ **13**.

Why other options are wrong:
(A) 7: computed as $25 - 15 - 3 = 7$ – subtracts b instead of adding it.
(B) 10: computed as $25 - 15 = 10$ – omits the final $+b$ term entirely.
(C) 15: computed as $25 - 10 = 15$ – uses $ab = 5 \times 2 = 10$ instead of $5 \times 3 = 15$, i.e., wrong value of b.

Answer: (D) Go Back to Q18

Q19.

Solution

Concept: Linear seating arrangement – building the order from given constraints.

Step 1 – Build the chain from the clues:
"Anil immediately to the left of Bina" and "Charu immediately to the right of Bina":
$\Rightarrow$ the sub-sequence is . . . Anil – Bina – Charu . . .

"Dev sits to the right of Charu": Dev is somewhere to the right of Charu.
"Ela sits to the left of Anil": Ela is somewhere to the left of Anil.

Step 2 – Fit all 5 into positions 1–5:

With only 5 seats and the sub-chain Anil(2)–Bina(3)–Charu(4), Ela must be in position 1 and Dev in position 5.
Order: **Ela (1) – Anil (2) – Bina (3) – Charu (4) – Dev (5)**.

Middle (position 3): Bina.

Why other options are wrong:
(A) Anil: position 2 (2nd from left).
(C) Charu: position 4 (4th from left).
(D) Dev: position 5 (rightmost).

Answer: (B) Go Back to Q19

Q20.

Solution

Concept: Syllogism – standard All/Some reasoning using set diagrams.

Statements:
I. All books are novels. (All B $\subseteq$ N)
II. Some novels are interesting. (Some N $\cap$ I $\neq \emptyset$)

Step 1 – Check Conclusion I: "All novels are books."
Statement I says all books are novels, i.e., B $\subseteq$ N. The converse (N $\subseteq$ B) is not given and need not hold. **Does NOT follow.**

Step 2 – Check Conclusion II: "Some books are interesting."
Statement II states some novels are interesting. However, the interesting novels might be non-book novels (since only *some* novels are books). We cannot guarantee any book is interesting. **Does NOT definitely follow.**

Step 3 – Check Conclusion III: "Some interesting things are novels."
Statement II: Some N are I, i.e., some novels are interesting. By simple conversion of an "I"-type statement (Some A are B $\Rightarrow$ Some B are A), we get: Some interesting things are novels. **Definitely FOLLOWS.**

Step 4 – Check Conclusion IV: "All interesting things are novels."
Not inferable – interesting things outside novels are not ruled out. **Does NOT follow.**

Answer: Only Conclusion III follows.

Why other options are wrong:
(A) Only I: Conclusion I is an invalid converse of Statement I.
(B) Only II: Conclusion II is not guaranteed since interesting novels may not overlap with books.
(D) Both I and II: both are invalid as explained above.

Answer: (C) Go Back to Q20

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	D	2	A	3	B	4	C	5	D
6	A	7	B	8	C	9	D	10	A
11	B	12	C	13	A	14	D	15	B
16	C	17	A	18	D	19	B	20	C