TALLENTEX Mental Ability

Sample Paper – 7

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, 5, 10, 17, 28, ?

(A) 38

(B) 40

(C) 41

(D) 43

Q2. Find the missing number in the following series:

3, 8, 15, 24, 35, ?

(A) 44

(B) 45

(C) 47

(D) 48

Q3. Find the missing letter in the following series:

A, B, D, G, K, ?

(A) P

(B) O

(C) Q

(D) R

Q4. Complete the analogy:

Petal : Flower :: Key : ?

(A) Lock

(B) Keyboard

(C) Piano

(D) Door

Q5. In each pair below, the second number is obtained from the first by a fixed rule.

$23 \rightarrow 6, \quad 46 \rightarrow 24, \quad 34 \rightarrow$ **?**

(A) 7

(B) 10

(C) 12

(D) 14

Q6. In a certain code language, the first 2 letters and the last 2 letters of a 4-letter word are swapped as complete blocks.

Example: **ABCD** $\rightarrow$ **CDAB**

Using the same rule, how will **PLAN** be written in that code?

(A) NAPL

(B) PNLA

(C) LAPN

(D) ANPL

Q7. In a certain code, each vowel is replaced by the next vowel in the cycle (A→E, E→I, I→O, O→U, U→A) and consonants remain unchanged.

If **ROSE** is coded as **RUSI**, how will **LIME** be coded?

(A) LOMI

(B) LNMI

(C) LOME

(D) LAMI

Q8. Deepa is Kiran's sister. Kiran is the daughter of Mohan. Rohan is Mohan's father.

How is **Deepa** related to **Rohan**?

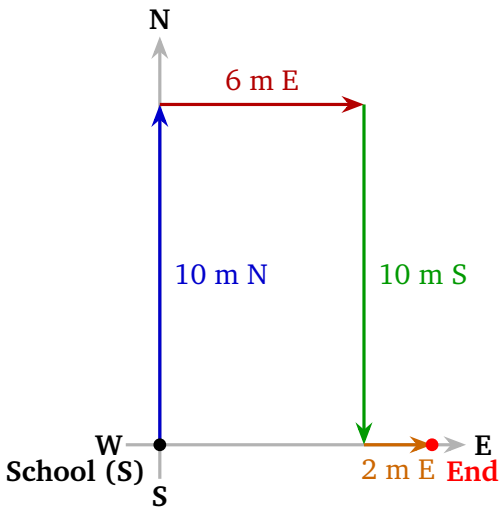
(A) Daughter

(B) Granddaughter

(C) Niece

(D) Sister

Q9. Starting from his school (point **S**), Raj walks **10 m North**, then **6 m East**, then **10 m South**, and finally **2 m East**. How far is Raj from his school, and in which direction?



(A) 6 m, East

(B) 10 m, North-East

(C) 8 m, East

(D) 8 m, North-East

Q10. A person initially faces **North**. He turns **right** (90° clockwise) **twice**, then turns **left** (90° anti-clockwise) **once**. Which direction is he now facing?

(A) South

(B) West

(C) North

(D) East

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

Novel, Short Story, Poem, Drama, Painting

(A) Painting

(B) Poem

(C) Novel

(D) Drama

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

8, 27, 64, 100, 125

(A) 64

(B) 100

(C) 27

(D) 125

Q13. Arjun is taller than Bhanu but shorter than Chetan. Deepak is taller than Arjun but shorter than Chetan.

Who is the **tallest** among the four?

(A) Arjun

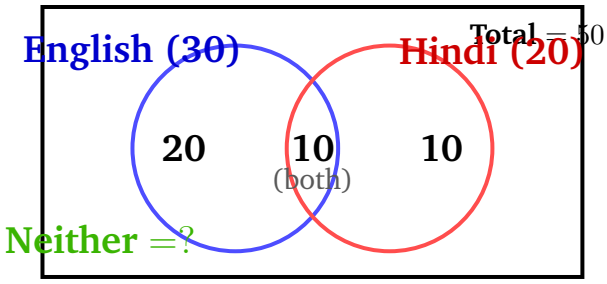
(B) Deepak

(C) Chetan

(D) Bhanu

Q14. In a group of 50 people, 30 read the English newspaper, 20 read the Hindi newspaper, and 10 read both. The Venn diagram below represents this information.

How many people read **neither** newspaper?



(A) 5

(B) 15

(C) 20

(D) 10

Q15. A special operation $*$ is defined as follows:

$a * b = a^2 + b^2$

For example: $4 * 3 = 16 + 9 = 25$ and $5 * 2 = 25 + 4 = 29$.

Find the value of $\mathbf{7 * 2}$.

(A) 53

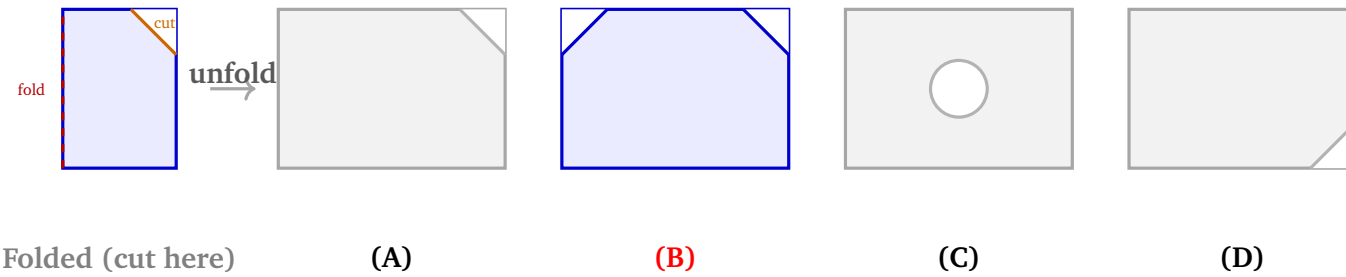
(B) 49

(C) 51

(D) 45

Q16. A rectangular sheet of paper is folded **once vertically** (left half onto right half). A **triangular cut** is made at the top-right corner of the folded

paper. When the paper is **unfolded**, which option correctly shows the resulting pattern?



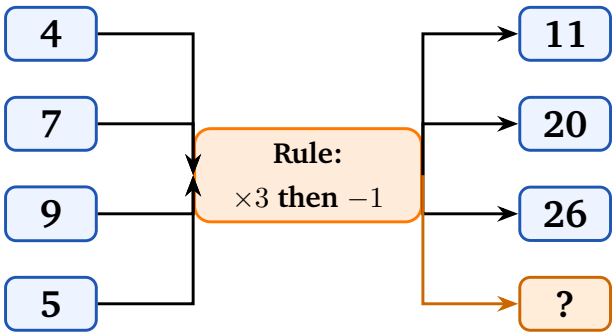
(A) Option A

(B) Option B

(C) Option C

(D) Option D

Q17. A machine applies a fixed rule to every input to produce an output. Study the examples and find the missing output.



(A) 12

(B) 13

(C) 14

(D) 15

Q18. Study the pattern in the 3×3 grid below. Find the number that should replace the question mark **(?)**.

1	2	3
4	5	6
7	8	?

(A) 11

(B) 10

(C) 8

(D) 9

Q19. In a family of 5 members **P, Q, R, S, T**, each person likes a different sport from: Cricket, Football, Tennis, Badminton, and Swimming.

- Q likes Football.
- P does not like Cricket or Swimming.
- R likes Tennis.
- S does not like Swimming.
- T likes neither Cricket nor Badminton.

Which sport does P like?

(A) Badminton

(B) Cricket

(C) Swimming

(D) Football

Q20. Statements:

I. All teachers are honest.

II. No honest person tells lies.

Conclusions:

I. No teacher tells lies.

II. All honest people are teachers.

Which conclusion/conclusions **definitely follow(s)**?

(A) Only Conclusion II

(B) Only Conclusion I

(C) Both Conclusion I and II

(D) Neither Conclusion I nor II

Detailed Solutions

Q1.

Solution

Concept: Number Series – adding consecutive prime numbers.

Step 1 – Find the differences:
$5-2=3$ (prime), $10-5=5$ (prime), $17-10=7$ (prime), $28-17=11$ (prime).
The differences are successive prime numbers: 3, 5, 7, 11, ...

Step 2 – Find the next prime:
The next prime after 11 is **13**.

Step 3 – Find the missing term:
$28+13=$ **41**.

Why other options are wrong:
(A) 38: difference $28+10=38$ – 10 is not prime.
(B) 40: difference $28+12=40$ – 12 is not prime.
(D) 43: difference $28+15=43$ – 15 is not prime.

Answer: (C) Go Back to Q1

Q2.

Solution

Concept: Number Series – product of consecutive integers $n \times (n+2)$.

Step 1 – Identify the rule:
$1\times3=3,\quad 2\times4=8,\quad 3\times5=15,\quad 4\times6=24,\quad 5\times7=35.$

Step 2 – Find the next term ($n=6$):
$6\times8=$ **48**.

Why other options are wrong:
(A) 44: $6\times7+2=44$ – incorrect formula.
(B) 45: $45=9\times5$ – does not fit the $n(n+2)$ pattern for $n=6$.
(C) 47: not expressible as $n(n+2)$ for any integer n.

Answer: (D) Go Back to Q2

Q3.

Solution

Concept: Letter Series – positions with increasing differences (triangular jumps).

Step 1 – Assign alphabetical positions:
A$=1$, B$=2$, D$=4$, G$=7$, K$=11$.

Step 2 – Find the differences:
$2-1=1$, $4-2=2$, $7-4=3$, $11-7=4$.
Differences increase by 1 each time: 1, 2, 3, 4, ...

Step 3 – Next difference is 5:
$11+5=16$.
The 16th letter of the alphabet is **P**.

Why other options are wrong:
(B) O is the 15th letter ($+4$ again – wrong).
(C) Q is the 17th letter ($+6$ – wrong).
(D) R is the 18th letter ($+7$ – wrong).

Answer: (A) Go Back to Q3

Q4.

Solution

Concept: Part-to-Whole analogy.

Step 1 – Understand the relationship:
A **Petal** is a part of a **Flower** – it names the whole object that contains the part.

Step 2 – Apply to Key:
A **Key** is a part of a **Keyboard** – the keyboard is the whole object that contains individual keys.

Why other options are wrong:
(A) Lock: a key is used with a lock (functional relationship), not a part of it.
(C) Piano: a piano has keys too, but the keyboard/piano analogy mixes things – "keyboard" is more precise.
(D) Door: a key opens a door; the door is not the whole that contains the key.

Answer: (B) Go Back to Q4

Q5.

Solution

Concept: Number Analogy – product of the digits of the two-digit number.

Step 1 – Identify the rule:

$23 \rightarrow 2 \times 3 = 6$. ✓

$46 \rightarrow 4 \times 6 = 24$. ✓

Step 2 – Apply the rule to 34:

$34 \rightarrow 3 \times 4 = \mathbf{12}$.

Why other options are wrong:

(A) 7: $3 + 4 = 7$ – uses addition instead of multiplication.

(B) 10: neither $3 + 4 + 3 = 10$ nor any standard operation on digits of 34 gives 10 logically.

(D) 14: $3 \times 4 + 2 = 14$ – adds an arbitrary constant.

Answer: (C) Go Back to Q5

Q6.

Solution

Concept: Coding-Decoding – block swap of first half and second half.

Step 1 – Understand the rule:

For a 4-letter word, the first 2 letters (block 1) and the last 2 letters (block 2) are swapped.

ABCD: Block 1 = AB, Block 2 = CD. Swap: CD + AB = CDAB. ✓

Step 2 – Apply to PLAN:

PLAN: Block 1 = PL, Block 2 = AN. Swap: AN + PL = **ANPL**.

Why other options are wrong:

(A) NAPL: reverses only the first block (N, A) then appends PL – not a block swap.

(B) PNLA: mixes individual letters rather than swapping blocks.

(C) LAPN: rearranges letters individually, not as blocks.

Answer: (D) Go Back to Q6

Q7.

Solution

Concept: Coding-Decoding – vowels shifted to the next vowel in the cycle; consonants unchanged.

Step 1 – Vowel cycle: A→E, E→I, I→O, O→U, U→A.

Step 2 – Verify with ROSE → RUSI:
R (consonant) → R. O (vowel) → U. S (consonant) → S. E (vowel) → I.
Result: RUSI. ✓

Step 3 – Encode LIME:
L (consonant) → L. I (vowel) → O. M (consonant) → M. E (vowel) → I.
Result: **LOMI**.

Why other options are wrong:
(B) LNMI: N is not the code for any letter in LIME – consonants must not change.
(C) LOME: E→E means vowel unchanged – rule not applied.
(D) LAMI: I→A would imply a different cycle (I→A skips two vowels).

Answer: (A) Go Back to Q7

Q8.

Solution

Concept: Blood Relations – multi-step family chain.

Step 1 – Build the family tree:
Rohan is Mohan's father (Rohan is the grandfather generation).
Kiran is Mohan's daughter (Kiran is the grandchild of Rohan).
Deepa is Kiran's sister ⇒ Deepa is also Mohan's daughter.

Step 2 – Determine the relationship:
Deepa is Mohan's daughter; Rohan is Mohan's father.
Therefore Deepa is Rohan's **granddaughter**.

Why other options are wrong:
(A) Daughter: Deepa would need to be Rohan's direct child (one generation gap), but she is two generations below.
(C) Niece: Niece implies Deepa is the daughter of Rohan's sibling – not the case here.
(D) Sister: Deepa is not in the same generation as Rohan.

Answer: (B) Go Back to Q8

Q9.

Solution

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

Step 1 – Trace the path (refer to the diagram in the question):
Start at S $= (0, 0)$.
Walk **10 m North**: reach $(0, 10)$.
Walk **6 m East**: reach $(6, 10)$.
Walk **10 m South**: reach $(6, 0)$.
Walk **2 m East**: reach $(6 + 2, 0) = (8, 0)$.

Step 2 – Find the displacement:
End point $(8, 0)$: $x = 8$ (East), $y = 0$ (no northward displacement).
Raj is **8 m East** of his school.

Why other options are wrong:
(A) 6 m East: accounts for only the first eastward leg, ignoring the second 2 m East.
(B) 10 m, North-East: there is no net northward displacement ($y = 0$).
(D) 8 m, North-East: the final y-coordinate is 0, so the direction is pure East, not North-East.

Answer: (C) Go Back to Q9

Q10.

Solution

Concept: Direction Sense – tracking facing direction after turns.

Step 1 – Apply each turn in sequence:
Start: faces **North**.
Turn right (90° clockwise): North $\rightarrow$ **East**.
Turn right again (90° clockwise): East $\rightarrow$ **South**.
Turn left (90° anti-clockwise): South $\rightarrow$ **East**.

Final direction: East.

Why other options are wrong:
(A) South: that was the direction after only two right turns, before the left turn.
(B) West: would require one more right turn from South.
(C) North: would require returning to start without any net turn.

Answer: (D) Go Back to Q10

Q11.

Solution

Concept: Classification – Odd One Out (art form category).

Step 1 – Classify each item:
Novel – literary form (written). Short Story – literary form (written). Poem – literary form (written). Drama – literary/performing art form. **Painting** – visual art form.

Step 2 – Identify the odd one:
Novel, Short Story, Poem, and Drama are all **literary art forms** (expressed through language/text/performance). A **Painting** is a visual art form and does not belong to the same category.

Why other options are wrong:
(B) Poem, (C) Novel, (D) Drama: all are literary/language-based art forms belonging to the same group.

Answer: (A) Go Back to Q11

Q12.

Solution

Concept: Classification – Odd One Out (perfect cubes).

Step 1 – Check each number:
$8 = 2^3$ (perfect cube). ✓
$27 = 3^3$ (perfect cube). ✓
$64 = 4^3$ (perfect cube). ✓
$125 = 5^3$ (perfect cube). ✓
100: $\sqrt[3]{100} \approx 4.64$ – **not a perfect cube.** $\times$

Step 2 – Identify the odd one:
All other numbers are perfect cubes. **100** is not a perfect cube and does not belong.

Why other options are wrong:
(A) $64 = 4^3$, (C) $27 = 3^3$, (D) $125 = 5^3$: all are perfect cubes.

Answer: (B) Go Back to Q12

Q13.

Solution

Concept: Ranking – ordering by comparison.

Step 1 – Extract inequalities from the clues:
"Arjun is taller than Bhanu but shorter than Chetan": Bhanu $<$ Arjun $<$ Chetan.
"Deepak is taller than Arjun but shorter than Chetan": Arjun $<$ Deepak $<$ Chetan.

Step 2 – Combine:
Bhanu $<$ Arjun $<$ Deepak $<$ Chetan.
Chetan is the tallest.

Why other options are wrong:
(A) Arjun: shorter than both Deepak and Chetan.
(B) Deepak: shorter than Chetan.
(D) Bhanu: the shortest of the four.

Answer: (C) Go Back to Q13

Q14.

Solution

Concept: Venn Diagram – inclusion-exclusion for two sets.

Step 1 – Apply the inclusion-exclusion principle:
People who read at least one newspaper $= n(\text{English}) + n(\text{Hindi}) - n(\text{both})$
$= 30 + 20 - 10 = 40$.

Step 2 – Find those who read neither:
Neither $=$ Total $-$ At least one $= 50 - 40 =$ **10**.

Verification from diagram:
English only $= 30 - 10 = 20$. Hindi only $= 20 - 10 = 10$. Both $= 10$.
Total accounted for $= 20 + 10 + 10 = 40$. Neither $= 50 - 40 = 10$. ✓

Why other options are wrong:
(A) 5: undercounts; would imply 45 read at least one newspaper.
(B) 15: would imply $30 + 20 - 10 - 15 = 25$ overlap – not consistent.
(C) 20: would imply only 30 read at least one – ignores Hindi-only readers.

Answer: (D) Go Back to Q14

Q15.

Solution

Concept: Mathematical Operations – custom operator $a * b = a^2 + b^2$.

Step 1 – Verify with examples:

$4 * 3 = 4^2 + 3^2 = 16 + 9 = 25$. ✓

$5 * 2 = 5^2 + 2^2 = 25 + 4 = 29$. ✓

Step 2 – Calculate $7 * 2$:

$7 * 2 = 7^2 + 2^2 = 49 + 4 =$ **53**.

Why other options are wrong:

(B) 49: that is 7^2 alone, ignoring 2^2.

(C) 51: $7^2 + 2 = 49 + 2 = 51$ – adds b instead of b^2.

(D) 45: $6^2 + 3^2 = 36 + 9 = 45$ – uses wrong base numbers.

Answer: (A) Go Back to Q15

Q16.

Solution

Concept: Paper Folding and Cutting – mirror symmetry about the fold line.

Step 1 – Understand the folding:

The sheet is folded vertically (left half onto right half). The fold line is the vertical centre of the sheet.

Step 2 – Analyse the cut:

A triangular cut is made at the **top-right corner** of the folded paper. Since the left half is folded onto the right half, the top-right corner of the folded paper corresponds to **both** the top-right and top-left corners of the original sheet.

Step 3 – Determine the unfolded pattern:

When unfolded, the cut produces **two symmetric triangular notches**: one at the top-left corner and one at the top-right corner, mirror images of each other about the vertical fold line.

This matches **Option B**.

Why other options are wrong:

(A): shows only one notch (top-right) – ignores the mirror cut on the other half.

(C): shows a circular hole – incorrect shape and position.

(D): shows a notch at the bottom-right – wrong location entirely.

Answer: (B) Go Back to Q16

Q17.

Solution

Concept: Missing Number – function/machine rule ($\times 3$ then -1).

Step 1 – Verify the rule with given examples:

Input 4: $4 \times 3 - 1 = 12 - 1 = 11$. ✓

Input 7: $7 \times 3 - 1 = 21 - 1 = 20$. ✓

Input 9: $9 \times 3 - 1 = 27 - 1 = 26$. ✓

Step 2 – Apply the rule to input 5:

$5 \times 3 - 1 = 15 - 1 = \mathbf{14}$.

Why other options are wrong:

(A) 12: $5 \times 3 = 15$, then $15 - 3 = 12$ – subtracts 3 instead of 1.

(B) 13: $5 \times 3 - 2 = 13$ – subtracts 2 instead of 1.

(D) 15: $5 \times 3 = 15$ – applies only the multiplication, omits the -1.

Answer: (C) Go Back to Q17

Q18.

Solution

Concept: Pattern Matrix – sequential filling row by row.

Step 1 – Observe the pattern:

The numbers 1 through 9 fill the 3×3 grid row by row, left to right, top to bottom.

Row 1: 1, 2, 3.

Row 2: 4, 5, 6.

Row 3: 7, 8, **?**

Step 2 – Find the missing number:

Continuing the sequence: the next number after 8 is **9**.

Why other options are wrong:

(A) 11: exceeds the 9-number sequence.

(B) 10: the sequence ends at 9 for a 3×3 grid.

(C) 8: already appears in position (3, 2) – no duplication allowed.

Answer: (D) Go Back to Q18

Q19.

Solution

Concept: Logical Puzzle – elimination using given constraints.

Step 1 – Apply given clues:
Q likes Football. R likes Tennis. (Two sports assigned.)
Remaining sports for P, S, T: Cricket, Badminton, Swimming.

Step 2 – Use clue: T likes neither Cricket nor Badminton:
The only remaining sport for T is **Swimming**. (T = Swimming.)

Step 3 – Remaining sports for P and S: Cricket and Badminton.
Clue: P does not like Cricket or Swimming.
Since Swimming is taken by T, and P cannot like Cricket, P must like **Badminton**.

Step 4 – S: The only sport left is **Cricket**. (S = Cricket.)
Check: S does not like Swimming – S likes Cricket. ✓

P likes Badminton.

Why other options are wrong:
(B) Cricket: explicitly excluded for P by the clue.
(C) Swimming: taken by T (derived above).
(D) Football: taken by Q.

Answer: (A) Go Back to Q19

Q20.

Solution

Concept: Syllogism – two-step deductive reasoning.

Statements:
I. All teachers are honest. (All T $\subseteq$ H)
II. No honest person tells lies. ($H \cap L = \emptyset$)

Step 1 – Check Conclusion I: "No teacher tells lies."
All teachers are honest (Statement I). No honest person tells lies (Statement II).
Combining: since every teacher is honest and no honest person tells lies, **no teacher tells lies**. **Conclusion I FOLLOWS.** ✓

Step 2 – Check Conclusion II: "All honest people are teachers."
Statement I says all teachers are honest, but this does **not** mean all honest people are teachers (the converse is not necessarily true – there could be honest people who are not teachers). **Conclusion II does NOT follow.** ×

Answer: Only Conclusion I follows.

Why other options are wrong:

(A) Only Conclusion II: Conclusion II is the invalid converse of Statement I.
(C) Both I and II: Conclusion II is not logically valid.
(D) Neither: Conclusion I is a valid two-step deduction.

Answer: (B) Go Back to Q20

Answer Key

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