

MAH B.P.Ed CET — Mental Ability

Sample Paper – 3

Duration: **18 Minutes** | Maximum Marks: **15** | Total Questions: **15**
Mode: Online CBT | Marking: **+1** (Correct), **0** (Incorrect / Unattempted)

Instructions

- This paper contains **15 Multiple Choice Questions (MCQs)**, each carrying **1 mark**.
- Each question has exactly **four options (A, B, C, D)**; select the **single best** answer.
- **There is NO negative marking**. Wrong or unattempted answers carry zero marks.
- Total time allowed: **18 minutes**. Maximum marks: **15**.
- Read each question carefully before marking your response.
- Questions **10, 13, 14, and 15** include supporting diagrams to aid reasoning.
- Click any question number in the solutions section to jump directly to the solution.

MENTAL ABILITY — QUESTIONS (Q1–Q15)

Q1. What is the next term in the following series?

2, 5, 10, 17, 26, ?

- A. 33
- B. 34
- C. 37
- D. 39

Q2. What is the next term in the following letter series?

Z, X, V, T, ?

- A. R
- B. Q
- C. S
- D. P

Q3. What is the next term in the following series?



1, 3, 6, 10, 15, ?

- A. 18
- B. 19
- C. 20
- D. 21

Q4. Complete the analogy:

School : Students :: Hospital : ?

- A. Doctors
- B. Patients
- C. Nurses
- D. Medicines

Q5. Complete the analogy:

Pentagon : 5 :: Octagon : ?

- A. 6
- B. 7
- C. 8
- D. 9

Q6. In a certain code language, **ACE** is written as **DFH**. Using the same rule, how is **MAN** coded?

- A. PDQ
- B. PCQ
- C. PEQ
- D. OCP

Q7. If **BOLD** is coded as **CPME**, how is **GAME** coded?

- A. HAME



- B. GCND
- C. HBNE
- D. HBNF

Q8. Find the **odd one out**:

Mercury, Venus, Earth, Sun

- A. Mercury
- B. Sun
- C. Venus
- D. Earth

Q9. Find the **odd one out** from the following numbers:

11, 13, 17, 19, 21

- A. 11
- B. 17
- C. 21
- D. 13

Q10. Statements:

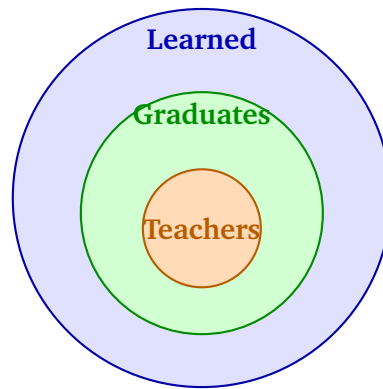
- (1) All teachers are graduates.
- (2) All graduates are learned.

Conclusions:

- I. All teachers are learned.
- II. Some learned people are teachers.

Study the Venn diagram and decide which conclusion(s) follow:





- A. Only Conclusion I follows
- B. Only Conclusion II follows
- C. Both Conclusion I and II follow
- D. Neither Conclusion I nor II follows

Q11. Statements:

- (1) All birds have wings.
- (2) Eagle is a bird.

Conclusions:

- I. Eagle has wings.
- II. All winged animals are birds.

Which conclusion(s) logically follow from the statements?

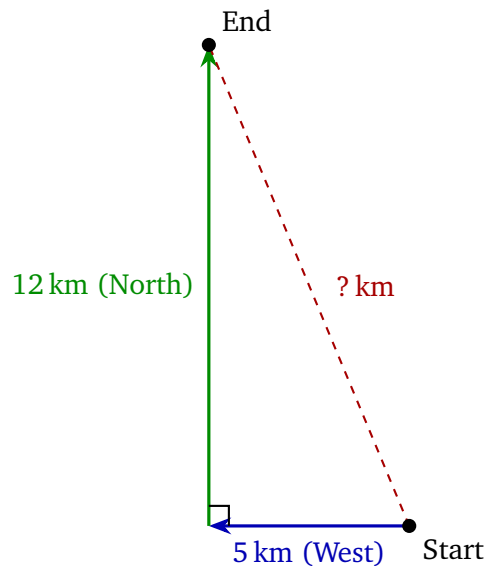
- A. Only Conclusion I follows
- B. Only Conclusion II follows
- C. Both Conclusion I and II follow
- D. Neither Conclusion I nor II follows

Q12. X is Y's maternal uncle's daughter. What is Y's relation to X?

- A. Niece
- B. Aunt
- C. Sister
- D. Cousin

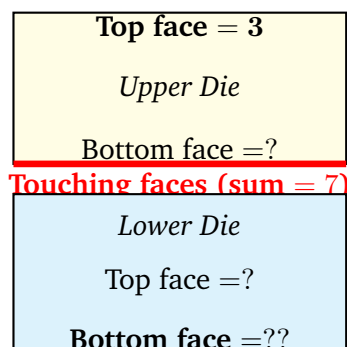
Q13. Rahul faces **South**. He turns **right** and walks **5 km**. He then turns **right** again and walks **12 km**. How far is he from the **starting point**?





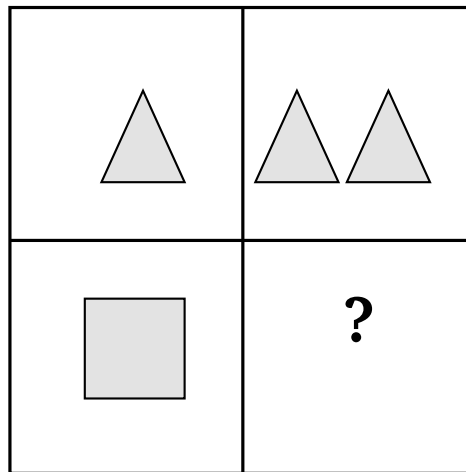
- A. 7 km
- B. 13 km
- C. 14 km
- D. 17 km

Q14. Two dice are stacked, one on top of the other. The **touching** (adjacent) faces of the two dice always sum to 7. If the **top face of the upper die shows 3**, what number is on the **bottom face of the lower die**?



- A. 3
- B. 4
- C. 5
- D. 6

Q15. In the figure matrix below, the number of shapes **doubles from left to right**. Identify the figure that replaces the “?” in the bottom-right cell.



- A. □ □ (Two Squares)
B. □ (One Square)
C. △ △ (Two Triangles)
D. △ (One Triangle)



DETAILED SOLUTIONS — Q1 TO Q15

Q1.

Solution

Concept: Each term equals $n^2 + 1$, where n is the position of the term (starting at $n = 1$).

Step-by-step verification:

Position (n)	Formula ($n^2 + 1$)	Term
1	$1^2 + 1 = 2$	2 ✓
2	$2^2 + 1 = 5$	5 ✓
3	$3^2 + 1 = 10$	10 ✓
4	$4^2 + 1 = 17$	17 ✓
5	$5^2 + 1 = 26$	26 ✓
6	$6^2 + 1 = 37$	37

Alternate view (differences): Consecutive differences are 3, 5, 7, 9 (odd numbers). Next difference = 11, so $26 + 11 = 37$.

Why the other options are wrong:

- **A (33):** $26 + 7 = 33$ — reuses the 4th difference instead of the 6th.
- **B (34):** Does not satisfy $n^2 + 1$ or the difference pattern.
- **D (39):** $6^2 + 3 = 39$ — wrong formula applied.

Answer: (C) [Go Back to Q 1](#)

Q2.

Solution

Concept: Each letter decreases by **2 positions** in the alphabet (every alternate letter going backward).

Step-by-step:

$$Z(26) \xrightarrow{-2} X(24) \xrightarrow{-2} V(22) \xrightarrow{-2} T(20) \xrightarrow{-2} R(18)$$

Why the other options are wrong:



- **B (Q):** $Q = 17$; $T(20) - Q(17) = 3$, not 2.
- **C (S):** $S = 19$; $T(20) - S(19) = 1$, not 2.
- **D (P):** $P = 16$; $T(20) - P(16) = 4$, not 2.

Answer: (A) [Go Back to Q 2](#)

Q3.

Solution

Concept: Triangular numbers — the n -th term is $T_n = \frac{n(n+1)}{2}$.

Step-by-step:

$$T_1 = 1, \quad T_2 = 3, \quad T_3 = 6, \quad T_4 = 10, \quad T_5 = 15, \quad T_6 = \frac{6 \times 7}{2} = 21$$

Alternate view (differences): 2, 3, 4, 5, 6 (each difference increases by 1). So $15 + 6 = 21$.

Why the other options are wrong:

- **A (18):** $15 + 3 = 18$ — uses the 2nd difference again.
- **B (19):** $15 + 4 = 19$ — uses the 3rd difference again.
- **C (20):** $15 + 5 = 20$ — uses the 5th difference instead of the 6th.

Answer: (D) [Go Back to Q 3](#)

Q4.

Solution

Concept: Institution → **Primary occupant** / **recipient** relationship.

Steps:

- A **School** is primarily attended by **Students** — they are the principal recipients of the institution's service.
- Similarly, a **Hospital** primarily serves **Patients** — they are the principal recipients.

Why the other options are wrong:

- **A (Doctors):** Doctors work *in* the hospital as service providers; they are staff, not the primary occupants.



- **C (Nurses):** Nurses are also staff members, not primary occupants.
- **D (Medicines):** Medicines are objects / materials used in the hospital, not occupants.

Answer: (B) [Go Back to Q 4](#)

Q5.

Solution

Concept: Polygon name $\rightarrow$ number of sides (Greek numeral prefix).

Steps:

- **Pentagon:** *penta* (Greek) = 5 $\Rightarrow$ 5 sides.
- **Octagon:** *octa* (Greek) = 8 $\Rightarrow$ 8 sides.

Why the other options are wrong:

- **A (6):** 6 sides = Hexagon (*hexa* = 6).
- **B (7):** 7 sides = Heptagon (*hepta* = 7).
- **D (9):** 9 sides = Nonagon (*nona* = 9).

Answer: (C) [Go Back to Q 5](#)

Q6.

Solution

Concept: Each letter is shifted **forward by +3 positions** in the alphabet.

Verification with the given code (ACE $\rightarrow$ DFH):

$$A(1) + 3 = D(4), \quad C(3) + 3 = F(6), \quad E(5) + 3 = H(8) \quad \Rightarrow \quad ACE \rightarrow DFH \checkmark$$

Applying the same rule to MAN:

$$M(13) + 3 = P(16), \quad A(1) + 3 = D(4), \quad N(14) + 3 = Q(17) \quad \Rightarrow \quad MAN \rightarrow PDQ$$

Why the other options are wrong:

- **B (PCQ):** Middle letter C would require $A + 3 = C$, but $A(1) + 3 = D(4)$, not C.



- **C (PEQ):** Middle letter E would require $A + 3 = E$, but $A(1) + 3 = D$, not E.
- **D (OCP):** First letter O would require $M + 3 = O$, but $M(13) + 3 = P(16)$, not O.

Answer: (A) [Go Back to Q 6](#)

Q7.

Solution

Concept: Each letter is shifted **forward by +1 position** in the alphabet.

Verification with the given code (BOLD $\rightarrow$ CPME):

$$B(2)+1=C(3), \quad O(15)+1=P(16), \quad L(12)+1=M(13), \quad D(4)+1=E(5) \Rightarrow \text{BOLD} \rightarrow \text{CPME}$$

Applying the same rule to GAME:

$$G(7)+1=H(8), \quad A(1)+1=B(2), \quad M(13)+1=N(14), \quad E(5)+1=F(6) \Rightarrow \text{GAME} \rightarrow \text{HBNF}$$

Why the other options are wrong:

- **A (HAME):** Second letter A is unchanged; $A + 1 = B$, not A.
- **B (GCND):** First letter G is unchanged; $G + 1 = H$, not G.
- **C (HBNE):** Last letter E is unchanged; $E + 1 = F$, not E.

Answer: (D) [Go Back to Q 7](#)

Q8.

Solution

Concept: Classification of celestial bodies — **planets** vs. **stars**.

Analysis:

- **Mercury** — a *planet* orbiting the Sun.
- **Venus** — a *planet* orbiting the Sun.
- **Earth** — a *planet* orbiting the Sun.
- **Sun** — a *star*; the central body of our Solar System.

Mercury, Venus, and Earth all belong to the same category: **planets**. The **Sun** is a star — the odd one out.



Why the other options are wrong:

- **A (Mercury):** Mercury is a planet; it belongs to the group.
- **C (Venus):** Venus is a planet; it belongs to the group.
- **D (Earth):** Earth is a planet; it belongs to the group.

Answer: (B) [Go Back to Q 8](#)

Q9.

Solution

Concept: Classification — **prime numbers** vs. **composite numbers**.

Analysis:

- **11** — divisors: 1, 11 $\Rightarrow$ *prime*.
- **13** — divisors: 1, 13 $\Rightarrow$ *prime*.
- **17** — divisors: 1, 17 $\Rightarrow$ *prime*.
- **19** — divisors: 1, 19 $\Rightarrow$ *prime*.
- **21** — $21 = 3 \times 7 \Rightarrow$ *composite* (has factors other than 1 and itself).

All other numbers are prime; **21** is the only composite number — the odd one out.

Why the other options are wrong:

- **A (11):** 11 is prime; belongs to the group.
- **B (17):** 17 is prime; belongs to the group.
- **D (13):** 13 is prime; belongs to the group.

Answer: (C) [Go Back to Q 9](#)

Q10.

Solution

Concept: Syllogism with two universal affirmative (All–All) statements; transitive subset inclusion.

Logical structure:

Teachers $\subset$ Graduates $\subset$ Learned

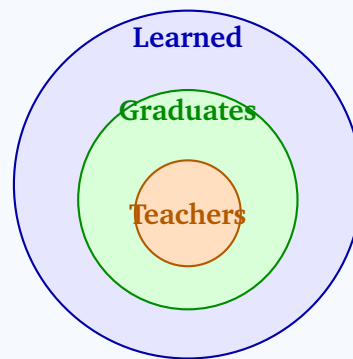


Conclusion I — “All teachers are learned”:

Teachers $\subset$ Graduates and Graduates $\subset$ Learned together imply Teachers $\subset$ Learned. **FOLLOWS.** ✓

Conclusion II — “Some learned people are teachers”:

Since *all* teachers are learned, teachers form a non-empty subset of learned people. Therefore, at least some learned people *are* teachers. **FOLLOWS.** ✓



The nested Venn diagram confirms that both conclusions hold.

Why the other options are wrong:

- **A (Only I):** Incorrect — Conclusion II also follows.
- **B (Only II):** Incorrect — Conclusion I also follows.
- **D (Neither):** Both conclusions are logically valid.

Answer: (C) [Go Back to Q 10](#)

Q11.

Solution

Concept: Deductive syllogism — applying a universal rule to a specific instance; identifying an invalid converse.

Conclusion I — “Eagle has wings”:

- Premise 2: Eagle is a bird.
- Premise 1: All birds have wings.
- $\therefore$ Eagle, being a bird, has wings.

FOLLOWS. ✓

Conclusion II — “All winged animals are birds”:

This is an *illicit converse* of Premise 1. “All A are B” does **not** imply “All B are A.”



Many animals have wings (bats, butterflies, flying fish) but are not birds. **DOES NOT FOLLOW.** ×

Why the other options are wrong:

- **B (Only II):** Conclusion II is an invalid over-generalisation; it does not logically follow.
- **C (Both):** Conclusion II is invalid; only I follows.
- **D (Neither):** Conclusion I directly and validly follows from the premises.

Answer: (A) [Go Back to Q 11](#)

Q12.

Solution

Concept: Blood relations — first-cousin relationship.

Steps:

- Y's **maternal uncle** = Y's mother's brother.
- Y's maternal uncle's **daughter** = X.
- Therefore, X's father is Y's mother's brother.
- Y's mother and X's father are **siblings** (sister and brother).
- Children of siblings are **first cousins**.
- ∴ Y is X's **Cousin** (and X is also Y's cousin — the relationship is symmetric).

Why the other options are wrong:

- **A (Niece):** Niece = sibling's daughter; the relationship here is through cousins, not siblings.
- **B (Aunt):** Aunt = parent's sister; not applicable in this chain.
- **C (Sister):** Sister implies the same parents; Y and X have different parents.

Answer: (D) [Go Back to Q 12](#)



Q13.

Solution

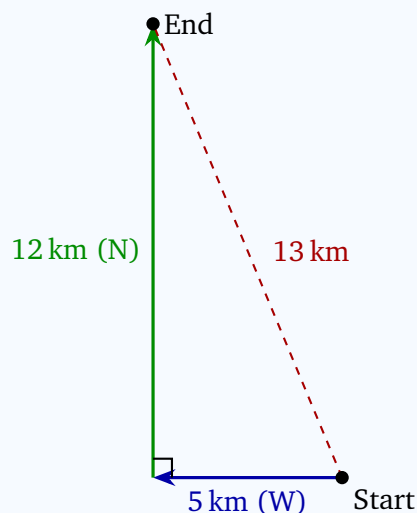
Concept: Direction sense combined with the Pythagorean theorem (5-12-13 Pythagorean triple).

Steps:

- Rahul starts facing **South**.
- Turns **right** $\Rightarrow$ now faces **West**. Walks **5 km** West.
- Turns **right** again $\Rightarrow$ now faces **North**. Walks **12 km** North.

Net displacement from start: 5 km West and 12 km North (perpendicular directions).

$$\text{Distance} = \sqrt{5^2 + 12^2} = \sqrt{25 + 144} = \sqrt{169} = 13 \text{ km}$$



Why the other options are wrong:

- **A (7 km):** $|12 - 5| = 7$ — valid only if both walks are collinear (same or opposite direction); here they are perpendicular.
- **C (14 km):** Not the result of the Pythagorean calculation for this triple.
- **D (17 km):** $5 + 12 = 17$ — this is the total *path length* walked, not the straight-line distance from start.

Answer: (B) [Go Back to Q 13](#)



Q14.

Solution

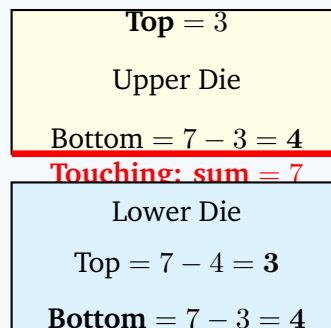
Concept: On a standard die, **opposite faces always sum to 7**. This rule applies within each individual die, and the problem states it also applies to the touching faces of the two stacked dice.

Step-by-step chain:

Step 1: Upper die. Top face = 3. Opposite (bottom) face = $7 - 3 = 4$.

Step 2: Touching faces. Bottom of upper die (4) + Top of lower die = 7. So Top of lower die = $7 - 4 = 3$.

Step 3: Lower die. Top face = 3. Opposite (bottom) face = $7 - 3 = 4$.



Why the other options are wrong:

- **A (3):** 3 is the value on the top of the upper die and the top of the lower die, but not the bottom of the lower die.
- **C (5):** $7 - 5 = 2$; the value 5 does not appear in the deduction chain.
- **D (6):** $7 - 6 = 1$; the value 6 does not appear in the deduction chain.

Answer: (B) [Go Back to Q 14](#)

Q15.

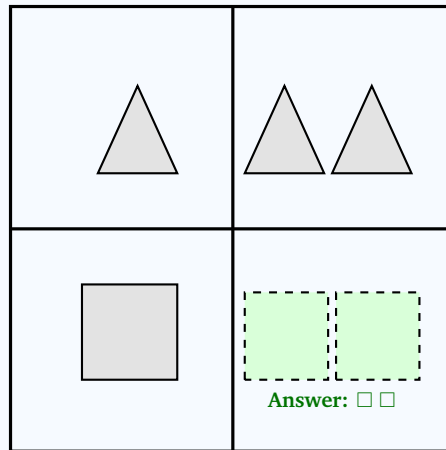
Solution

Concept: Figure matrix with two rules: (1) the **quantity of shapes doubles** from the left cell to the right cell in each row; (2) the **shape type** is fixed for each row.

Pattern analysis:

- **Row 1 (triangles):** Top-left = $1 \triangle \xrightarrow{\times 2}$ Top-right = $2 \triangle \triangle$.
- **Row 2 (squares):** Bottom-left = $1 \square \xrightarrow{\times 2}$ Bottom-right = $2 \square \square$.





Why the other options are wrong:

- B (□, one square): Quantity = 1 — does not follow the doubling pattern.
- C (△△, two triangles): Wrong shape — Row 2 uses squares, not triangles.
- D (△, one triangle): Wrong shape and wrong quantity.

Answer: (A)

[Go Back to Q 15](#)



ANSWER KEY — MENTAL ABILITY SAMPLE PAPER 3

Quick Reference Answer Key

Click on any answer letter to jump directly to its detailed solution.

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

Balance: A × 4 B × 4 C × 4 D × 3 | Total: 15 Questions

