

# MAH B.P.Ed CET — Sample Paper

## Mental Ability | Paper 1 of 8

|                 |                                            |
|-----------------|--------------------------------------------|
| Total Questions | 15                                         |
| Maximum Marks   | 15                                         |
| Duration        | 18 Minutes                                 |
| Marking Scheme  | +1 for correct answer; No negative marking |
| Mode            | Online CBT                                 |
| Question Type   | Single-correct MCQ (4 options each)        |

*Each question has four options (A)–(D). Select the single most appropriate answer.*

### Instructions

1. This paper contains **15 Multiple Choice Questions (MCQs)**.
2. Each correct answer carries **+1 mark**. There is **no negative marking** for wrong answers.
3. Each question has **four** options – (A), (B), (C), (D). Select the **single best** answer.
4. Total time allotted is **18 minutes**.
5. Do not spend too much time on any single question; move on and return if time permits.
6. The detailed answer key and solutions are provided after the question paper.
7. Questions on Series, Analogy, Coding, Classification, Syllogism, Blood Relations, Direction and Figure Matrix are covered in this paper.

### Section — Mental Ability (Q1 to Q15)

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

4, 9, 16, 25, 36, \_\_\_\_\_

- (A) 45
- (B) 49
- (C) 47
- (D) 48

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

B, D, G, K, P, \_\_\_\_\_

- (A) T
- (B) U
- (C) V
- (D) W

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

3, 6, 12, 24, 48, \_\_\_\_\_

- (A) 96
- (B) 84
- (C) 90
- (D) 102

**Q4.** Choose the word that best completes the analogy below.

**Pen : Write :: Knife : \_\_\_\_\_**

- (A) Sharpen
- (B) Hurt
- (C) Pierce
- (D) Cut

**Q5.** Choose the number that best completes the analogy below.

**5 : 25 :: 9 : \_\_\_\_\_**

- (A) 54
- (B) 81
- (C) 90
- (D) 99



**Q6.** In a certain code language, **DESK** is written as **FGUM** (each letter is shifted forward by 2 positions in the alphabet). Using the same rule, how is **HOME** coded in that language?

- (A) IQOF
- (B) IPOG
- (C) JQOG
- (D) JROG

**Q7.** If **SUN = 54** using the code in which each letter is replaced by its position in the alphabet (A=1, B=2, ..., Z=26) and the code value is the *sum* of those position numbers, what is the code for **DIM**?

- (A) 26
- (B) 22
- (C) 28
- (D) 30

**Q8.** Four terms are given below. Three of them belong to a common category. Find the **odd one out**.

Whale    Dolphin    Porpoise    Shark

- (A) Whale
- (B) Dolphin
- (C) Porpoise
- (D) Shark

**Q9.** Four terms are given below. Three share a common mathematical property. Find the **odd one out**.

4      9      16      25      35

- (A) 4
- (B) 35



(C) 16

(D) 25

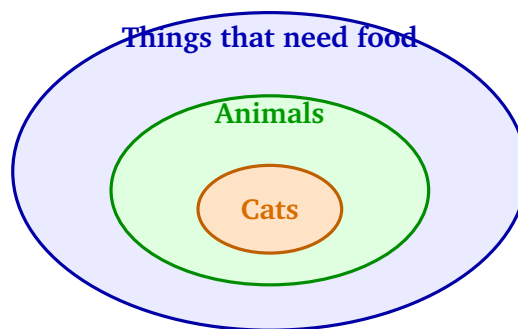
**Q10. Directions (Q10–Q11):** In each of the following questions, two statements are given followed by two conclusions numbered I and II. Assume the given statements to be true even if they seem to differ from commonly known facts, and decide which of the given conclusions logically follows from the statements.

**Statements:**

- (i) All cats are animals.
- (ii) All animals need food.

**Conclusions:**

- I. All cats need food.
- II. Some things that need food are cats.



- (A) Only Conclusion I follows
- (B) Only Conclusion II follows
- (C) Both Conclusions I and II follow
- (D) Neither Conclusion I nor II follows

**Q11.** (Refer to directions given in Q10)

**Statements:**



- (i) All students passed.
- (ii) Meera is a student.

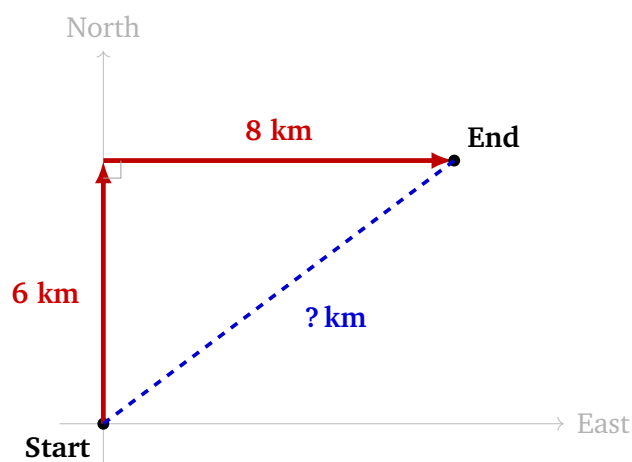
**Conclusions:**

- I. Meera passed.
  - II. All who passed are students.
- (A) Only Conclusion I follows  
(B) Only Conclusion II follows  
(C) Both Conclusions I and II follow  
(D) Neither Conclusion I nor II follows

**Q12.** P is Q's father's only brother. What is P's relation to Q?

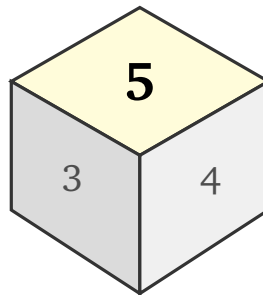
- (A) Father
- (B) Grandfather
- (C) Brother
- (D) Uncle

**Q13.** Aman starts from a point and walks **6 km towards North**. He then turns to his right and walks **8 km towards East**. What is the **straight-line distance** from his starting point to his current position?



- (A) 7 km
- (B) 10 km
- (C) 14 km
- (D) 15 km

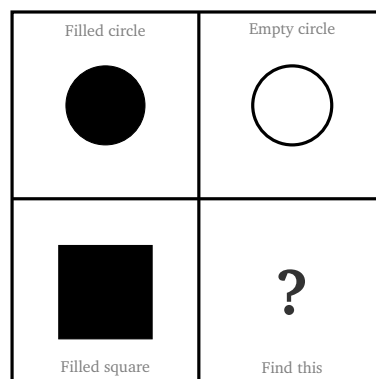
**Q14.** On a **standard die**, the numbers on *opposite faces always sum to 7*. If the **top face** of a standard die shows **5**, what number appears on the **bottom face**?



*Top face shows 5  $\Rightarrow$  Bottom face = ?*

- (A) 2
- (B) 3
- (C) 4
- (D) 6

**Q15.** Study the  $2 \times 2$  figure matrix given below. Identify the pattern and select the figure that should replace the question mark (?) in the bottom-right cell.



- (A) ■ (Filled square)
- (B) ● (Filled circle)
- (C) □ (Empty square)
- (D) ○ (Empty circle)



## Detailed Solutions — Mental Ability

Q1.

## Solution

Series: 4, 9, 16, 25, 36, \_\_\_\_\_

Each term is a **perfect square** of consecutive natural numbers:

$$2^2 = 4, \quad 3^2 = 9, \quad 4^2 = 16, \quad 5^2 = 25, \quad 6^2 = 36, \quad 7^2 = 49.$$

The next term in the sequence is 49.

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

Q2.

## Solution

Series: B, D, G, K, P, \_\_\_\_\_

Convert letters to their alphabetical positions and find the differences:

| Letter   | B | D  | G  | K  | P  | ?  |
|----------|---|----|----|----|----|----|
| Position | 2 | 4  | 7  | 11 | 16 |    |
| Gap      |   | +2 | +3 | +4 | +5 | +6 |

The gaps increase by 1 each time. The next gap is +6:  $16 + 6 = 22$ . The 22nd letter of the alphabet is V.Answer: (C) [Go Back to Q 2](#)

Q3.

## Solution

Series: 3, 6, 12, 24, 48, \_\_\_\_\_

This is a **geometric series** with common ratio  $r = 2$ . Each term is obtained by multiplying the previous term by 2:

$$3 \times 2 = 6, \quad 6 \times 2 = 12, \quad 12 \times 2 = 24, \quad 24 \times 2 = 48, \quad 48 \times 2 = 96.$$





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

Q4.

### Solution

The analogy is based on the **primary function** of a tool:

Pen  $\xrightarrow{\text{primary function}}$  Write

Knife  $\xrightarrow{\text{primary function}}$  Cut

A pen is primarily used to *write*; a knife is primarily used to *cut*. (Sharpen, Hurt, and Pierce may be secondary or accidental functions but not the primary one.)

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

Q5.

### Solution

The relationship is **number : its square** ( $x : x^2$ ):

$$5 : 25 = 5 : 5^2 \implies 9 : 9^2 = 9 : 81.$$

Verify:  $9^2 = 81$ . ✓

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

Q6.

### Solution

**Rule:** Each letter is shifted **forward by 2 positions** in the alphabet.

**Verification with DESK:**

| Plain letter | D | E | S  | K  |
|--------------|---|---|----|----|
| Position     | 4 | 5 | 19 | 11 |
| Position + 2 | 6 | 7 | 21 | 13 |
| Coded letter | F | G | U  | M  |

$\Rightarrow$  DESK  $\rightarrow$  FGUM ✓



Applying to HOME:

|              |    |    |    |   |
|--------------|----|----|----|---|
| Plain letter | H  | O  | M  | E |
| Position     | 8  | 15 | 13 | 5 |
| Position + 2 | 10 | 17 | 15 | 7 |
| Coded letter | J  | Q  | O  | G |

HOME is coded as JQOG.

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

Q7.

### Solution

**Rule:** Code value = sum of alphabetical position values of all letters (A=1, B=2, ..., Z=26).

**Verification with SUN:**

$$S(19) + U(21) + N(14) = 54 \checkmark$$

**For DIM:**

$$D(4) + I(9) + M(13) = 4 + 9 + 13 = 26.$$

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

Q8.

### Solution

- **Whale** – a marine *mammal* (warm-blooded, breathes air, nurses young with milk).
- **Dolphin** – a marine *mammal* (same characteristics).
- **Porpoise** – a marine *mammal* (closely related to dolphins).
- **Shark** – a *fish* (cold-blooded, breathes through gills, cartilaginous skeleton).

Whale, Dolphin, and Porpoise are all **marine mammals**; Shark is a **fish** and does not belong to the same biological class. Therefore, the odd one out is **Shark**.

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



Q9.

**Solution**

Check each number for the property of being a **perfect square**:

$$4 = 2^2, \quad 9 = 3^2, \quad 16 = 4^2, \quad 25 = 5^2.$$

Now check 35:  $5^2 = 25$  and  $6^2 = 36$ , so 35 lies *between* two consecutive perfect squares and is **not** itself a perfect square.

Therefore, the odd one out is **35**.

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

Q10.

**Solution**

**Given statements (assumed true):**

- (i) All cats are animals.  $\Rightarrow \text{Cats} \subset \text{Animals}$ .
- (ii) All animals need food.  $\Rightarrow \text{Animals} \subset \text{Things-that-need-food}$ .

By transitivity (as shown in the nested Venn diagram):

$$\text{Cats} \subset \text{Animals} \subset \text{Things-that-need-food}.$$

**Conclusion I: “All cats need food.” – TRUE.**

Since  $\text{Cats} \subset \text{Animals}$  and  $\text{Animals} \subset \text{Things-that-need-food}$ , by transitivity  $\text{Cats} \subset \text{Things-that-need-food}$ , i.e., all cats need food.

**Conclusion II: “Some things that need food are cats.” – TRUE.**

Since cats are a non-empty subset of things that need food, there exist things that need food that are cats (namely, every cat). This is a valid particular affirmative inference.

$\therefore$  **Both Conclusions I and II follow.**

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



Q11.

**Solution****Given statements (assumed true):**

- (i) All students passed.  $\Rightarrow$  Students  $\subset$  Passed.
- (ii) Meera is a student.

**Conclusion I: “Meera passed.” – TRUE.**

Meera is a student (Statement ii) and all students passed (Statement i), so Meera passed. This is a valid deductive inference (universal instantiation).

**Conclusion II: “All who passed are students.” – FALSE.**

Statement (i) says “*All students passed*” but does *not* say “*Only students passed*”. Others (non-students) may also have passed. Concluding the converse is an illicit conversion and is logically invalid.

$\therefore$  Only Conclusion I follows.

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

Q12.

**Solution****Breaking down the relation step by step:**

Q's father's brother = Q's **Uncle** (Paternal uncle / Chacha)

Since P is Q's father's *only* brother, P is Q's **Uncle**.

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

Q13.

**Solution**

Aman's path forms a **right triangle**:

- Vertical leg (North) = 6 km
- Horizontal leg (East) = 8 km
- The right angle is at the turning point (North-East corner)

By the **Pythagorean theorem**, the straight-line distance  $d$  from Start to End is:

$$d = \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10 \text{ km.}$$

*Tip:* (6, 8, 10) is a Pythagorean triple – it is simply  $2 \times (3, 4, 5)$ .

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

Q14.

**Solution**

On a **standard die**, opposite faces always sum to 7:

$$1 \leftrightarrow 6, \quad 2 \leftrightarrow 5, \quad 3 \leftrightarrow 4.$$

If the **top face** shows 5, then:

$$\text{Bottom face} = 7 - 5 = 2.$$

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

Q15.

**Solution**

**Pattern:** In each row, the *filled* version of a shape transforms into the *empty* (out-line) version of the **same** shape.

|                   |                                      |
|-------------------|--------------------------------------|
| <b>Top row</b>    | Filled circle (●) → Empty circle (○) |
| <b>Bottom row</b> | Filled square (■) → ?                |



Applying the same pattern: Filled square → **Empty square** (□).

**Answer: (C)** [Go Back to Q 15](#)



## Answer Key — Mental Ability Sample Paper 1

### MAH B.P.Ed CET — Mental Ability — Sample Paper 1

15 Questions | +1 per correct answer | No negative marking

| Q.No. | Answer | Q.No. | Answer | Q.No. | Answer | Q.No. | Answer | Q.No. | Answer |
|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|
| 1     | B      | 2     | C      | 3     | A      | 4     | D      | 5     | B      |
| 6     | C      | 7     | A      | 8     | D      | 9     | B      | 10    | C      |
| 11    | A      | 12    | D      | 13    | B      | 14    | A      | 15    | C      |

| Option       | Count     |
|--------------|-----------|
| (A)          | 4         |
| (B)          | 4         |
| (C)          | 4         |
| (D)          | 3         |
| <b>Total</b> | <b>15</b> |

*Click on any answer letter in the table above to jump to the detailed solution.*

*For the question, click the **QN** label in the Solutions section.*

