

MAH B.P.Ed CET

Mental Ability — Sample Paper 8

Total Marks: 15

Time: 18 Minutes

Questions: 15

Mode: Online CBT

Marking: +1 correct, no negative marking

Instructions

- This paper contains **15 multiple-choice questions** (MCQ), each with four options and a **single correct answer**.
- Each correct answer carries +1 **mark**. There is **no negative marking** for wrong or unattempted answers.
- Maximum marks: **15** Total time: **18 minutes** Medium: **Online CBT**.
- Read each question carefully before selecting your answer.
- The answer key and detailed solutions are provided at the end of this paper.

SECTION A — MENTAL ABILITY (15 Questions × 1 Mark = 15 Marks)

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

5, 10, 20, 40, 80, _____

- (A) 100
- (B) 120
- (C) 140
- (D) 160

Answer: (D)

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

M, J, G, D, _____

- (A) A
- (B) B
- (C) C
- (D) E

Answer: (A)



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

1, 5, 14, 30, 55, _____

(Hint: Observe the cumulative sums of consecutive perfect squares.)

- (A) 77
- (B) 91
- (C) 84
- (D) 99

Answer: (B)

Q4. Select the word that best completes the analogy.

Bee : Honey :: Cow : ?

- (A) Calf
- (B) Grass
- (C) Milk
- (D) Hide

Answer: (C)

Q5. Select the number that best completes the analogy.

64 : 4 :: 125 : ?

- (A) 3
- (B) 15
- (C) 25
- (D) 5

Answer: (D)

Q6. In a certain code language, **CAR** is written as **XZI** using the *mirror alphabet* rule ($A \leftrightarrow Z$, $B \leftrightarrow Y$, $C \leftrightarrow X$, ..., $M \leftrightarrow N$). Using the same rule, how is **BUS** coded?

- (A) YFH



- (B) ZGI
- (C) XFH
- (D) YEH

Answer: (A)

Q7. If **BIRD** is coded as **2-9-18-4** (each letter is replaced by its position number in the English alphabet: A = 1, B = 2, ..., Z = 26), what is the code for **FISH**?

- (A) 5-9-18-7
- (B) 6-9-19-8
- (C) 7-10-20-9
- (D) 6-8-19-8

Answer: (B)

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

Iron Gold Copper Rubber

- (A) Iron
- (B) Gold
- (C) Rubber
- (D) Copper

Answer: (C)

Q9. Find the **odd one out**:

7 14 21 28 33

- (A) 7
- (B) 14
- (C) 21
- (D) 33

Answer: (D)



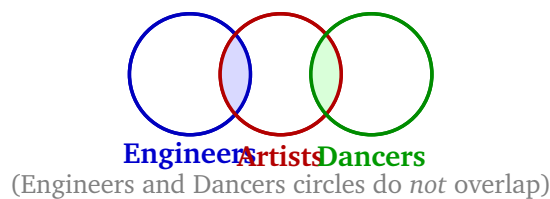
Q10. Statements:

- Some engineers are artists.
- Some artists are dancers.

Conclusions:

- I. Some engineers are dancers.
- II. All dancers are engineers.

Referring to the Venn diagram below, which conclusion(s) logically follow(s)?



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

Answer: (D)

Q11. Statements:

- All rivers flow.
- Ganga is a river.

Conclusions:

- I. Ganga flows.
- II. All flowing things are rivers.

Which conclusion(s) logically follow(s)?

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



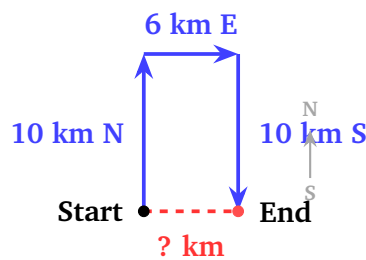
Answer: (A)

Q12. A is the son of B. B's sister is C. C's husband is D. What is D's relation to A?

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

Answer: (B)

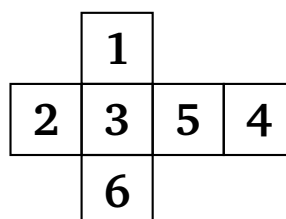
Q13. Geeta walks 10 km North, then turns and walks 6 km East, then turns and walks 10 km South. How far (straight-line distance) is she from her starting point?



- (A) 10 km
- (B) 4 km
- (C) 16 km
- (D) 6 km

Answer: (D)

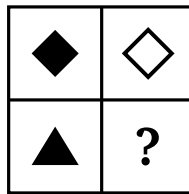
Q14. The figure below shows an **unfolded net** of a die. When folded into a cube, which numbered face is **opposite** to face 2?



- (A) 1
- (B) 4
- (C) 5
- (D) 6

Answer: (C)

Q15. Study the 2×2 figure matrix and identify the figure that should replace the '?'.



- (A)  (outline triangle)
- (B)  (filled triangle)
- (C)  (outline diamond)
- (D)  (filled diamond)

Answer: (A)



DETAILED SOLUTIONS

Sol. 1.

Solution

Series: 5, 10, 20, 40, 80, ?**Pattern:** Each term is obtained by multiplying the previous term by 2 (geometric series, common ratio = 2).

$$5 \xrightarrow{\times 2} 10 \xrightarrow{\times 2} 20 \xrightarrow{\times 2} 40 \xrightarrow{\times 2} 80 \xrightarrow{\times 2} 160$$

Answer: 160 (Option D)

Sol. 2.

Solution

Series: M, J, G, D, ?**Pattern:** Replace each letter with its position number in the alphabet (A=1, B=2, ..., Z=26):

$$M(13) \xrightarrow{-3} J(10) \xrightarrow{-3} G(7) \xrightarrow{-3} D(4) \xrightarrow{-3} A(1)$$

Each term decreases by 3 positions. Next position: $4 - 3 = 1$, which corresponds to the letter A.**Answer:** A (Option A)

Sol. 3.

Solution

Series: 1, 5, 14, 30, 55, ?**Pattern:** Each term T_n equals the cumulative sum of the first n perfect squares ($T_n = \sum_{k=1}^n k^2$):

$$T_1 = 1^2 = 1$$

$$T_2 = 1^2 + 2^2 = 1 + 4 = 5$$

$$T_3 = 1^2 + 2^2 + 3^2 = 1 + 4 + 9 = 14$$

$$T_4 = 1 + 4 + 9 + 16 = 30$$

$$T_5 = 1 + 4 + 9 + 16 + 25 = 55$$

$$T_6 = 1 + 4 + 9 + 16 + 25 + 36 = 55 + 36 = 91$$



Answer: 91 (Option B)

Sol. 4.

Solution

Analogy: Bee : Honey :: Cow : ?

Relationship: A *Bee* produces *Honey* (its primary natural product). By the same relationship, a *Cow* produces *Milk*.

The distractors are incorrect:

- **Calf** — the offspring of a cow, not a product.
- **Grass** — food consumed by a cow, not produced.
- **Hide** — a by-product (skin), not the primary product.

Answer: Milk (Option C)

Sol. 5.

Solution

Analogy: 64 : 4 :: 125 : ?

Relationship: The second number is the *cube root* of the first.

$$\sqrt[3]{64} = 4 \implies \sqrt[3]{125} = 5$$

Verification: $5^3 = 125$ ✓

Answer: 5 (Option D)

Sol. 6.

Solution

Mirror Alphabet Rule: Each letter at position n maps to position $27 - n$ ($A \leftrightarrow Z$, $B \leftrightarrow Y$, $C \leftrightarrow X$, ..., $M \leftrightarrow N$).

Verification (CAR → XZI):

$$C(3) \rightarrow X(24), \quad A(1) \rightarrow Z(26), \quad R(18) \rightarrow I(9) \quad \checkmark$$

Coding BUS:

$$B(2) \rightarrow Y(25), \quad U(21) \rightarrow F(6), \quad S(19) \rightarrow H(8)$$

Code for BUS: YFH



Answer: YFH (Option A)

Sol. 7.

Solution

Coding Rule: Each letter is replaced by its position number in the English alphabet ($A = 1, B = 2, \dots, Z = 26$).

Verification (BIRD $\rightarrow$ 2-9-18-4):

$$B = 2, \quad I = 9, \quad R = 18, \quad D = 4 \quad \checkmark$$

Coding FISH:

$$F = 6, \quad I = 9, \quad S = 19, \quad H = 8$$

Code for FISH: **6-9-19-8**

Answer: 6-9-19-8 (Option B)

Sol. 8.

Solution

Group: Iron, Gold, Copper, Rubber.

Classification:

- **Iron, Gold, Copper** — all are *metals*: solid at room temperature, conduct electricity and heat, malleable and ductile.
- **Rubber** — a *non-metallic polymer* (organic, hydrocarbon-based); it is an electrical insulator and does not share metallic properties.

Rubber does not belong to the metals category and is therefore the odd one out.

Answer: Rubber (Option C)

Sol. 9.

Solution

Group: 7, 14, 21, 28, 33.

Check divisibility by 7:

$$7 \div 7 = 1 \quad \checkmark \quad 14 \div 7 = 2 \quad \checkmark \quad 21 \div 7 = 3 \quad \checkmark \quad 28 \div 7 = 4 \quad \checkmark$$

$$33 \div 7 = 4.71 \dots \quad (\text{not a whole number}) \quad \times$$



All numbers *except* 33 are exact multiples of 7. Hence 33 is the odd one out.

Answer: 33 (Option D)

Sol. 10.

Solution

Premises (both particular affirmative):

1. Some engineers are artists. $(E \cap A \neq \emptyset)$
2. Some artists are dancers. $(A \cap D \neq \emptyset)$

Analysis:

- **Conclusion I** (*Some engineers are dancers*): Two 'Some' (particular) premises cannot guarantee any definite relationship between Engineers and Dancers. The Venn diagram shows a valid scenario where $E \cap D = \emptyset$. **Does not follow.**
- **Conclusion II** (*All dancers are engineers*): A universal conclusion cannot be drawn from two particular premises. **Does not follow.**

Answer: Neither conclusion follows (Option D)

Sol. 11.

Solution

Premises:

1. All rivers flow. (Universal affirmative; Rivers $\subseteq$ Flowing things)
2. Ganga is a river. (Particular affirmative)

Analysis:

- **Conclusion I** (*Ganga flows*): Ganga is a river (P2) and all rivers flow (P1). By syllogism, Ganga flows. **Valid** ✓
- **Conclusion II** (*All flowing things are rivers*): This is an *invalid converse* of P1. Many things flow (lava, blood, air) without being rivers. **Does not follow.**

Answer: Only Conclusion I follows (Option A)



Sol. 12.

Solution**Given relations:**

- A is the son of B. (B is A's parent)
- B's sister is C. (C is B's sibling, female $\Rightarrow$ C is A's paternal aunt)
- C's husband is D.

Family chain:

$$B \xrightarrow{\text{parent of}} A \quad B \xrightarrow{\text{sister}} C \xrightarrow{\text{married to}} D$$

C is the paternal aunt of A. D is the husband of A's aunt. By family convention, the husband of one's aunt is called **Uncle** (by marriage).

Answer: Uncle (Option B)

Sol. 13.

Solution**Journey breakdown:**

1. 10 km North $\Rightarrow$ vertical displacement = +10 km
2. 6 km East $\Rightarrow$ horizontal displacement = +6 km
3. 10 km South $\Rightarrow$ vertical displacement = -10 km

Net displacement:

$$\text{Vertical: } +10 - 10 = 0 \text{ km} \quad \text{Horizontal: } +6 \text{ km (East)}$$

The northward and southward journeys cancel exactly. Geeta ends up **6 km due East** of her starting point.

$$\text{Straight-line distance from start} = \sqrt{0^2 + 6^2} = \sqrt{36} = 6 \text{ km}$$

Answer: 6 km (Option D)

Sol. 14.

Solution**Die net layout:**

$$\underbrace{[2][3][5][4]}_{\text{horizontal strip, left to right}} \quad \text{with } [1] \text{ above } [3] \text{ and } [6] \text{ below } [3]$$

Folding analysis (face 3 is the pivot/front face):

Face	Position in net	Becomes (after folding)	Opposite pair
1	above face 3	Top face	1 $\longleftrightarrow$ 6
6	below face 3	Bottom face	
2	left of face 3	Left face	2 $\longleftrightarrow$ 5
5	right of face 3	Right face	
4	right of face 5	Back face	3 $\longleftrightarrow$ 4

The face opposite to face **2** is face **5**.

Answer: 5 (Option C)

Sol. 15.

Solution

Matrix layout:

◆ (filled diamond)	◇ (outline diamond)
▲ (filled triangle)	?

Rule: Within each row, the shape changes from *filled* (left column) to *outline/hollow* (right column), while the *shape type* remains the same.

- Row 1: ◆ $\rightarrow$ ◇ (diamond: filled $\rightarrow$ outline) ✓
- Row 2: ▲ $\rightarrow$ △ (triangle: filled $\rightarrow$ outline)

The missing figure is an **outline triangle** (△).

Answer: △ (outline triangle) (Option A)

ANSWER KEY

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

Marking Scheme: +1 for each correct answer; 0 for incorrect or unattempted.

Total Questions: 15 **Total Marks:** 15 **Time Allowed:** 18 minutes

