## SECTION I : LOGICAL REASONING

**1. In the given question, which pair of numbers is different from the other three.**

**(A)** 13 – 2197 **(B)** 15 – 3375 **(C)** 14 – 2744 **(D)** 18 – 5834

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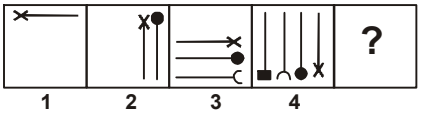
**DIRECTION (2-3) : The following questions consist of problem figures followed by four other figures marked A, B, C and D called the answer figures. Select a figure from amongst the answer figures which will continue the same series as established by the problem figures.**

**2.** Problem figures




**(A)**  **(B)**  **(C)**  **(D)** 

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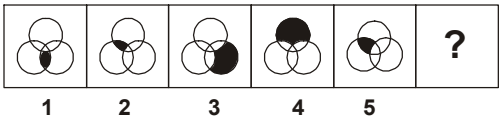
**3.** Problem figures




**(A)**  **(B)**  **(C)**  **(D)** 

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**DIRECTION (4-6) : Answer the following questions on the basis of the following alphabets.**

**A B C D E F G H I J K L M N O P Q R S T U V W X Y Z**

**4. Which letter is 9$^{th}$ to the left of 9$^{th}$ letter from the right end?**

**(A)** J **(B)** K **(C)** H **(D)** I

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**5. If the above alphabets, are written in the reverse order, which letter will be 12$^{th}$ to the left of the 16$^{th}$ letter from the left ?**

**(A)** X **(B)** W **(C)** D **(D)** V

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**6. What should come in place of the question mark (?) in the following letter series ?**

**BD CEF DFGH ?**

**(A)** EGHIJ **(B)** EGHI **(C)** EFGHI **(D)** EGHIJK

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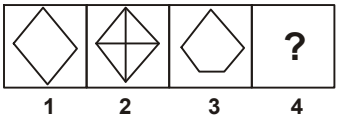
**DIRECTION (7-8) : In the following questions, problem figures 1 and 2 are related in a particular manner. Establish the same relationship between problem figures 3 and 4 by choosing a figure from amongst the four options, which would replace the question mark in fig. (4)**

**7.** Problem figures




**(A)**  **(B)**  **(C)**  **(D)** 

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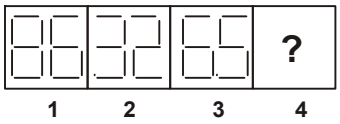
8. Problem figures




(A) 
(B) 
(C) 
(D) 

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**DIRECTION (9-11) : In the following questions, two columns I and II have been given. In column I few words are given and in column II their codes have been given using a particular rule. The order of the smaller letter have been placed in jumbled up form. Decode the language and choose the alternative which is equal to the letter asked in the questions.**

| | Column I | | Column II |
|---|---|---|---|
| (1) | DESIGN | (A) | uklbjz |
| (2) | INFORM | (B) | cbxkqy |
| (3) | MOTHER | (C) | ygzwxc |
| (4) | RIGHTS | (D) | bjucgw |
| (5) | TAILOR | (E) | wcpybv |
| (6) | GARDEN | (F) | vzcjlk |

**9. What is the code for the letter N ?**

**(A)** u **(B)** k **(C)** c **(D)** g

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**10. What is the code for the letter O ?**

**(A)** y **(B)** k **(C)** v **(D)** c

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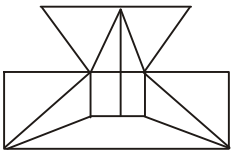
**11. What is the code for the letter G ?**

**(A)** l **(B)** p **(C)** b **(D)** j

---

**12. Find the minimum number of straight lines required to make the given figure.**



**(A)** 16 **(B)** 17

**(C)** 18 **(D)** 19

---

**13. 'A' walks 10 m towards East and then 10 m to his right. Then every time turning to his left, he walks 5, 15 and 15 m, respectively. How far is he now from his starting point?**

**(A)** 5 m **(B)** 10 m **(C)** 15 m **(D)** 20 m

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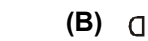
**DIRECTION (14-15) : Choose the correct mirror image.**

**14. PAINTED**

**(A)**  **(B)**  **(C)**  **(D)** 

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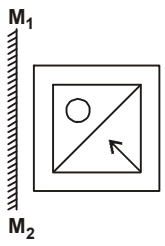
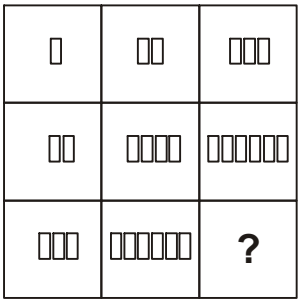
**15. The mirror is represented by a line $M_1M_2$.**




**(A)** 
**(B)** 
**(C)** 
**(D)** 

---

**16. In the adjoining matrix, find out which of the following options completes the figure matrix ?**



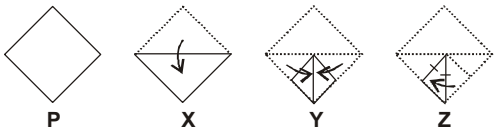

**(A)** 

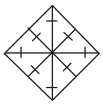
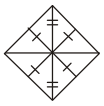
**(B)** 

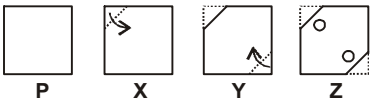
**(C)** 

**(D)** 

**DIRECTION (17-18) : Each of the following questions consists of a set of four figures P, X, Y and Z showing a sequence of folding of a piece of paper. Fig. (Z) shows the manner in which the folded paper has been cut. These four figures are followed by four options from which you have to choose a figure which would most closely resemble the unfolded form of fig. (Z).**

**17.** 


**(A)**  **(B)**  **(C)**  **(D)** 

**18.** 


**(A)**  **(B)**  **(C)**  **(D)** 

**19. Facing towards south, *P* started walking and turned left after walking 30 m, he walked 25 m and turned left and walked 30 m. How far is he from his starting position and in which direction ?**

**(A)** At the starting point only **(B)** 25 m, West

**(C)** 25 m, East **(D)** 30 m, East

**20. If '100' interchange '1000', '–' interchange '÷', '×' interchange '+', then**

**$100 - 10 \times 1000 \div 1000 \times 100 \times 10 = ?$**

**(A)** 1090 **(B)** 0 **(C)** 1110 **(D)** 20

## SECTION II : MATHEMATICAL REASONING

**21. Which of the following statements is correct ?**

**(A)** If $x^6 + 1$ is divided by $x + 1$, then the remainder is –2.

**(B)** If $x^6 + 1$ is divided by $x - 1$, then the remainder is 2.

**(C)** If $x^6 + 1$ is divided by $x + 1$, then the remainder is 1.

**(D)** If $x^6 + 1$ is divided by $x - 1$, then the remainder is –1.

**22. Instead of walking along two adjacent sides of a rectangular field, a boy took a short cut along the diagonal of the field and saved a distance equal to $\frac{1}{2}$ of the longer side. Then the ratio of the shorter side of the rectangle to the longer side is _____.**

**(A)** $\frac{1}{2}$ **(B)** $\frac{3}{4}$ **(C)** $\frac{4}{3}$ **(D)** $\frac{5}{7}$

**23. Which of the following is possible ?**

**(A)** $\cos\theta = \frac{7}{5}$ **(B)** $\sin\theta = \frac{13}{12}$ **(C)** $\sec\theta = \frac{4}{5}$ **(D)** $\tan\theta = 41$

---

**24. Graph of a quadratic polynomial is a _____.**

**(A)** Straight line **(B)** Circle **(C)** Parabola **(D)** Ellipse

---

**25. Seven times of a two digit number is equal to four times the number obtained by reversing the order of digits and the sum of the digits is 3. Find the number.**

**(A)** 12 **(B)** 10 **(C)** 15 **(D)** 20

---

**26. Let $\alpha$, $\beta$ be the roots of the equation $(x - a)(x - b) + c = 0$, $c \neq 0$. The roots of the equation $(x - \alpha)(x - \beta) - c = 0$ are ____.**

**(A)** $a$, $c$ **(B)** $b$, $c$ **(C)** $a$, $b$ **(D)** $a + c$, $b + c$

---

**27. If $x = (\sec A - \tan A)(\sec B - \tan B)(\sec C - \tan C) = (\sec A + \tan A)(\sec B + \tan B)(\sec C + \tan C)$, then $x$ =**

**(A)** 0 **(B)** 1 **(C)** –1 **(D)** ± 1

---

**28. Match the column :**

| | Column I | | Column II |
|---|---|---|---|
| 1. | The ratio of any two corresponding sides in equiangular triangles is always the same. | (A) | Baudhayan |
| 2. | The diagonal of a rectangle produces by itself the same area as produced by its both sides (i.e., length and breadth). | (B) | Thales |
| 3. | In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides. | (C) | Pythagoras |
| | | (D) | Aryabhatta |

**(A)** 1 → A, 2 → B, 3 → C **(B)** 1 → B, 2 → A, 3 → C **(C)** 1 → B, 2 → C, 3 → A **(D)** 1 → B, 2 → A, 3 → D

---

**29. Equation of line $L_1$ : $a_1x + b_1y + c_1 = 0$, Equation of line $L_2$ : $a_2x + b_2y + c_2 = 0$,**

**Equation of line $L_3$ : $(a_1x + b_1y + c_1) + (a_2x + b_2y + c_2) = 0$, if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$, then line $L_3$ is ___.**

**(A)** Parallel to line $L_1$ **(B)** Parallel to line $L_2$

**(C)** Is coincident with $L_2$ or $L_1$ **(D)** None of these

---

**30. Match the column :**

| | Column I | | Column II |
|---|---|---|---|
| 1. | $2x + 5y = 10$<br>$3x + 4y = 7$ | (A) | Unique solution |
| 2. | $2x + 5y = 10$<br>$6x + 15y = 20$ | (B) | Infinitely many solutions |
| 3. | $5x + 2y = 10$<br>$10x + 4y = 20$ | (C) | No solution |

**(A)** 1 → A, 2 → B, 3 → C **(B)** 1 → B, 2 → C, 3 → A **(C)** 1 → C, 2 → B, 3 → A **(D)** 1 → A, 2 → C, 3 → B

---

31. **Median of the observation**

| $x_i$ | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|
| $f_i$ | 4 | 5 | 7 | 9 | 7 | 6 |

**is ____.**

**(A)** 9 **(B)** 10 **(C)** 7 **(D)** 8

---

32. **sin $4A$ = cos $(A - 20°)$, where $4A$ is an acute angle, find the value of $A$.**

**(A)** 22° **(B)** 25° **(C)** 35° **(D)** 60°

---

33. **If the sum of the areas of two circles with radii $R_1$ and $R_2$ is equal to the area of a circle of radius $R$, then _____.**

**(A)** $R_1 + R_2 = R$ **(B)** $R_1^2 + R_2^2 = R^2$ **(C)** $R_1 + R_2 < R$ **(D)** $R_1^2 + R_2^2 < R^2$

---

34. **One root of the quadratic equation $2x^2 - x + \frac{1}{8} = 0$ is $\frac{1}{4}$. The other root is _____.**

**(A)** 0 **(B)** $\frac{1}{4}$ **(C)** $\frac{1}{8}$ **(D)** $-\frac{1}{4}$

---

35. **Pairs of natural numbers whose least common multiple is 78 and the greatest common divisor is 13 are _____.**

**(A)** 58 and 13 or 16 and 29 **(B)** 68 and 23 or 36 and 49

**(C)** 18 and 73 or 56 and 93 **(D)** 78 and 13 or 26 and 39

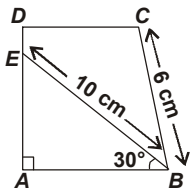
---

36. **A toothed wheel of diameter 50 cm is attached to a smaller wheel of diameter 30 cm. How many revolutions will the smaller wheel make when the larger one makes 15 revolutions ?**

**(A)** 23 **(B)** 24 **(C)** 25 **(D)** 26

---

37. **In the given figure, length of $AE$ = _____.**




**(A)** 4 cm

**(B)** 5 cm

**(C)** 6 cm

**(D)** 8 cm

---

38. **Match the column :**

| | Column I | | Column II |
|---|---|---|---|
| 1. | Probability of sure event is | (A) | $\frac{1}{2}$ |
| 2. | Probability of impossible event is | (B) | 0 |
| 3. | If $A$ and $B$ are complementary events, then | (C) | 1 |
| | | (D) | $P(B) = 1 - P(A)$ |
| | | (E) | $P(A) = P(B)$ |

**(A)** 1 → A, 2 → B, 3 → C **(B)** 1 → B, 2 → A, 3 → C

**(C)** 1 → C, 2 → B, 3 → E **(D)** 1 → C, 2 → B, 3 → D

---

39. **A river 1.5 m deep and 36 m wide is flowing at the rate of 3.5 km per hour. The amount of water that runs into the sea per minute (in cubic metres) is _____.**

**(A)** 31500 **(B)** 3150 **(C)** 3150000 **(D)** 6300

---

**40. If the circumference of a circle and the perimeter of a square are equal, then _____.**

**(A)** Area of the circle = Area of the square **(B)** Area of the circle > Area of the square

**(C)** Area of the circle < Area of the square

**(D)** Nothing definite can be said about the relation between the areas of the circle and square.

## SECTION III : EVERYDAY MATHEMATICS

**41. A forester wants to plant 66 apple trees, 88 banana trees and 110 mango trees in equal rows (in terms of number of trees). Also he wants to make distinct rows of trees (i.e., only one type of trees in one row). The number of minimum rows required are _____.**

**(A)** 2 **(B)** 3 **(C)** 10 **(D)** 12

---

**42. Rahul was asked his age by his friend. Rahul said "The number you get when you subtract 25 times of my age from twice the square of my age will be thrice your age. If the friend's age is 14, then the age of Rahul is _____.**

**(A)** 20 **(B)** 22 **(C)** 18 **(D)** 14

---

**43. A sailor goes 8 km downstream in 40 minutes and comes back in one hour. Determine the speed of the sailor in still water and speed of the current.**

**(A)** 10 km/hr, 2 km/hr **(B)** 9 km/hr, 2 km/hr **(C)** 8 km/hr, 3 km/hr **(D)** 6 km/hr, 4 km/hr

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**44. A farmer wishes to start a 100 sq. m rectangular vegetable garden. Since he has only 30 m barbed wire, he fences three sides of the garden letting his house compound wall act as the fourth side fencing. The dimension of the garden is ____.**

**(A)** 15 m $\times$ 6.67 m **(B)** 20 m $\times$ 5 m **(C)** 30 m $\times$ 3.33 m **(D)** 40 m $\times$ 2.5 m

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**45. Half cubic metre of gold sheet is extended by hammering so as to cover an area of 1 hectare. The thickness of the sheet is**

**(A)** 0.0005 cm **(B)** 0.005 cm **(C)** 0.05 cm **(D)** 0.5 cm

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**46. A money lender finds that due to a fall in the annual rate of interest from 8% to $7\frac{3}{4}\%$, his yearly income diminishes by ₹ 61.50. His capital is _____.**

**(A)** ₹ 22,400 **(B)** ₹ 23,800 **(C)** ₹ 24,600 **(D)** ₹ 26,000

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**47. How many lead shots each 3 mm in diameter can be made from a cuboid of dimensions 9 cm $\times$ 11 cm $\times$ 12 cm ?**

**(A)** 7200 **(B)** 8400 **(C)** 72000 **(D)** 84000

---

**48. In what ratio must rice at ₹ 7.20 per kg be mixed with rice at ₹ 5.70 per kg so that the mixture be worth ₹ 6.30 per kg.**

**(A)** 1 : 3 **(B)** 2 : 3 **(C)** 3 : 4 **(D)** 4 : 5

---

**49. A bank offers 5% compound interest calculated on half-yearly basis. A customer deposits ₹ 1600 each on 1st January and 1st July of a year. At the end of the year, the amount he would have gained by way of interest is _____.**

**(A)** ₹ 120 **(B)** ₹ 121 **(C)** ₹ 122 **(D)** ₹ 123

---

**50. A towel, when bleached, was found to have lost 20% of its length and 10% of its breadth. The percentage of decrease in area is _____.**

**(A)** 10% **(B)** 10.08% **(C)** 20% **(D)** 28%

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**SPACE FOR ROUGH WORK**

# ANSWER KEYS

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (D) | **2.** | (D) | **3.** | (B) | **4.** | (D) | **5.** | (B) | **6.** | (A) | **7.** | (D) | **8.** | (A) | **9.** | (B) |
| **10.** | (D) | **11.** | (D) | **12.** | (B) | **13.** | (A) | **14.** | (B) | **15.** | (C) | **16.** | (B) | **17.** | (B) | **18.** | (C) |
| **19.** | (C) | **20.** | (C) | **21.** | (B) | **22.** | (B) | **23.** | (D) | **24.** | (C) | **25.** | (A) | **26.** | (C) | **27.** | (D) |
| **28.** | (B) | **29.** | (C) | **30.** | (D) | **31.** | (D) | **32.** | (A) | **33.** | (B) | **34.** | (B) | **35.** | (D) | **36.** | (C) |
| **37.** | (B) | **38.** | (D) | **39.** | (B) | **40.** | (B) | **41.** | (D) | **42.** | (D) | **43.** | (A) | **44.** | (B) | **45.** | (B) |
| **46.** | (C) | **47.** | (B) | **48.** | (B) | **49.** | (B) | **50.** | (D) | | | | | | | | |