

MATHEMATICS TEST –BEFORE PRE BOARD-DAY 02

STD –X

DATE-28/11/2025 (PART I)

TIME 40 MIN

MM 15

(1) If two positive integers a and b are written as $a = xy^2$ and $b = x^3y$, where a and b are prime numbers, then $LCM(a, b)$ is

- (a) x^2y^2 (b) xy (c) x^3y^2 (d) none of these

(2) The zeros of the quadratic polynomial $ax^2 + bx + c \neq 0$ are equal, then

- (a) c and a have opposite signs (b) both negative
(c) One positive and one negative (d) both equal

(3) If $px^2 + 3x + q = 0$ has two roots $x = -1$ and $x = -2$, the value of $q - p$ is

- (a) -1 (b) 1 (c) 2 (d) -2

(4) If $ax^2 + bx + c = 0$ has equal roots, then $a =$

- (a) $\frac{b^2}{4c}$ (b) $-\frac{b^2}{4c}$ (c) $\frac{b}{2c}$ (d) $-\frac{b}{2c}$

(5) The point which lies on the perpendicular bisector of the line segment joining the points $A(-2, -5)$ and $B(2, 5)$ is

- (a) $(0, 0)$ (b) $(0, 2)$ (c) $(2, 0)$ (d) $(-2, 0)$

(6) Area enclosed between two concentric circles is 770 cm^2 . If the radius of the outer circle is 21 cm , then the radius of the inner circle is

- (a) 12 cm (b) 13 cm (c) 14 cm (d) 15 cm

(7) An arc of a circle is of length $5\pi \text{ cm}$ and the sector it bounds has an area of $20\pi \text{ cm}^2$. The radius of the circle is

- (a) 1 cm (b) 5 cm (c) 8 cm (d) 10 cm

(8) $\sum f_i = 18$, $\sum f_i x_i = 2p + 24$ and mean of any distribution is 2 , then p is equal to

- (a) 3 (b) 4 (c) 8 (d) 6

(9) For the following distribution

Class	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9

The sum of the lower limits of the median class and modal class is

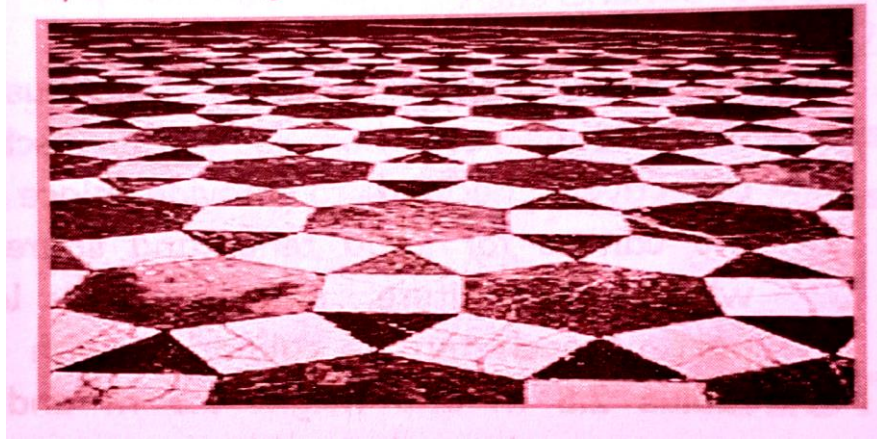
- (a) 15 (b) 25 (c) 30 (d) 35

(10) After throwing two dice simultaneously what is the probability of getting doublet

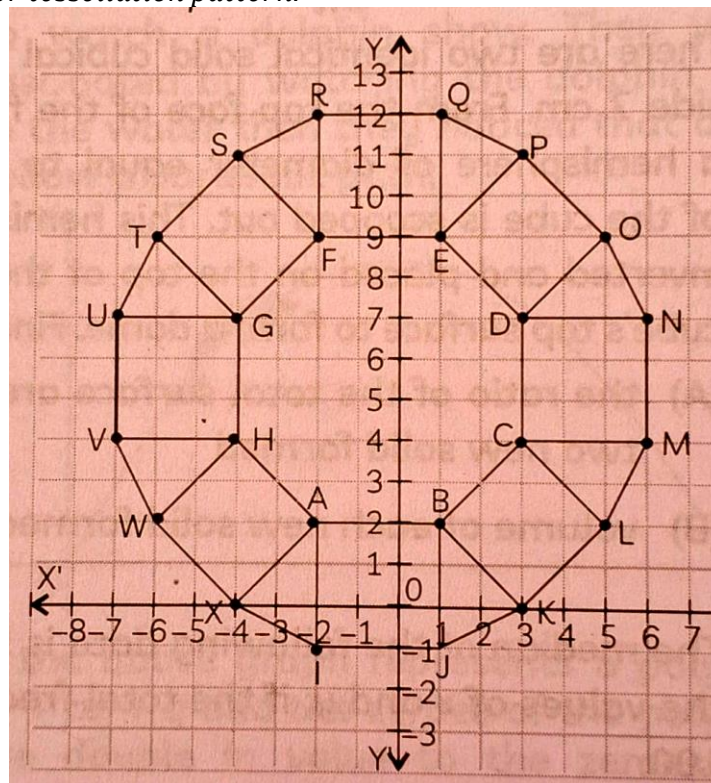
- (a) 1 (b) 0 (c) $\frac{1}{6}$ (d) $\frac{7}{32}$

(11) CASE STUDY-

Tiling or tessellation of a flat surface is the covering of a plane using one or more geometric shapes, called tiles, with no overlaps and no gaps. Historically, tessellations were used in ancient Rome and in Islamic art. You may find tessellation patterns on floors, walls, paintings etc. A tiled floor in the archaeological Museum of Seville (shown in figure) has been made using squares, triangles, hexagons.



A craftsman thought of making a floor pattern after being inspired by the above design. To ensure accuracy in his work, he made the pattern on the Cartesian plane. He used regular octagons, squares and triangles for his floor tessellation pattern.



- (a) What is the length of the segment joining points B and F? 1
- (b) The centre Z in the figure will be the point of intersection of the diagonals of quadrilateral WXOP. Then what are the coordinates of Z? 2
- (c) What are the coordinates of the point on y axis equidistant from A and G? 2