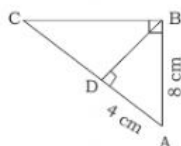


## MATHEMATICS MODEL – I PAPER

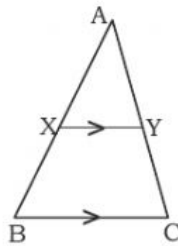
Four choices are given for each of the questions/incomplete statements. Choose the correct answer and shade the correct choice in the OMR given to you with blue / black ball point pen.

1. The linear equation which is coincidental to the equation  $-5x+2y=4$  is  
 A.  $10x+4y=8$       B.  $-10x-4y+8=0$       C.  $-10x+4y-8=0$       D.  $10x-4y=8$
2. For what value of 'p' does the pair of linear equations  $4x+py+8=0$  and  $2x+2y+2=0$  has unique solution  
 A. p value is other than 4      B. p value is 4  
 C. p value is greater than 4      D. p value is less than 4
3. The tabular column shows the value x and y of a linear equation  $3x+y-11=0$ . The correct value of 'a' is  
 A. a=2      B. a=3      C. a=5      D. a=0
 

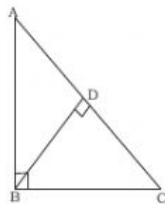
x	2	3	6
y	5	a	-4
4. A pair of linear equations  $a_1x+b_1y+c_1=0$  and  $a_2x+b_2y+c_2=0$  intersect at  $(-2,3)$  when represented graphically. Find the value of x and y.  
 A.  $x=2, y=-3$       B.  $x=-2, y=-3$       C.  $x=-2, y=3$       D.  $x=2, y=3$
5. If  $2 \cos 3\theta = 1$  find the value of  $\theta$   
 A.  $30^\circ$       B.  $20^\circ$       C.  $45^\circ$       D.  $60^\circ$
6. In an A.P. the first term is 3 and the common difference is twice the first term. Then its  $10^{\text{th}}$  term is  
 A. 54      B. 60      C. 51      D. 57
7. The A.P in the following set of numbers is  
 A. 12, 2, -8, -18      B. 1, 1, 1, 2, 2      C. 3, 6, 12, 24      D. 2, 3, 5, 8, 13
8. Which term of the A.P. 5, 9, 13... is 81?  
 A. 20      B. 19      C. 21      D. 18
9. In an A.P. of three consecutive terms  $(x-y)^2, (x^2+y^2), (x-y)^2$  the common difference is  
 A.  $2x^2+2y^2$       B.  $x^2+y^2$       C.  $2xy$       D.  $-2xy$
10. Two A.P.s have the same common difference and their first terms are -1 and -8 respectively. The difference between their  $4^{\text{th}}$  term is  
 A. -1      B. 7      C. -8      D. -9
11. In  $\triangle ABC$   $\angle B = 90^\circ$  and  $BD \perp AC$ . If  $AB = 8\text{cm}$ ,  $AD = 4\text{cm}$ , find the length of CD.  
 A. 12cm      B. 16cm      C. 14cm      D.  $4\sqrt{3}\text{cm}$



12. The length of the side of a square is 5 cm. Then its diagonal is  
 A. 6cm                      B. 5cm                      C.  $5\sqrt{2}$  cm                      D.  $6\sqrt{2}$  cm
13. The area of  $\triangle ABC = 16\text{cm}^2$  and  $\triangle DEF = 25\text{cm}^2$  and  $BC = 4\text{cm}$ . Then EF is  
 A. 4 cm                      B. 5 cm                      C. 6 cm                      D. 4.5 cm
14. In the  $\triangle ABC$  and  $XY \parallel BC$ . Apply basic proportionality theorem to this triangle in mathematical form is

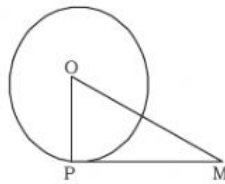


- A.  $\frac{AX}{BX} = \frac{AY}{CY}$                       B.  $\frac{AB}{AY} = \frac{AC}{CY}$                       C.  $\frac{AX}{AY} = \frac{AC}{AB}$                       D.  $\frac{AX}{AC} = \frac{AY}{AB}$
15. In  $\triangle ABC$   $\angle B = 90^\circ$  and BD is a perpendicular bisector of AC. Then the ratio of the area of  $\triangle ADB$  to the area of  $\triangle ABC$  is

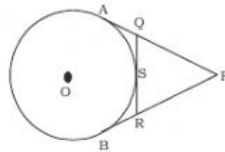


- A. 1:1                      B. 1:2                      C. 2:1                      D. 1:4
16. If  $\tan\theta + \cot\theta = 5$ , find the value of  $\tan^2\theta + \cot^2\theta$  is  
 A. 25                      B. 10                      C. 23                      D. 20
17. If  $\tan x = 3\cot x$  then the value of x is  
 A.  $45^\circ$                       B.  $30^\circ$                       C.  $90^\circ$                       D.  $60^\circ$
18. The value of  $(\sin 40^\circ - \cos 50^\circ)$  is  
 A.  $\sin 10^\circ$                       B.  $-\sin 10^\circ$                       C. 0                      D.  $\cos 10^\circ$
19. If the roots of the equation  $ax^2 + bx + c = 0$  are equal then 'c' is equal to  
 A.  $\frac{b^2}{4a}$                       B.  $\frac{-b}{2a}$                       C.  $\frac{b^2}{-4a}$                       D.  $\frac{b}{2a}$
20. The quadratic equation in the following is  
 A.  $x + \frac{2}{x} = x^2$                       B.  $x^2\sqrt{2} + 7x + 5 = 0$                       C.  $x^2 - \frac{1}{x} = 5$                       D.  $3x^2 - 2y = 5$

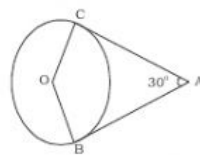
21. If one root of the equation  $x^2 - 4x - 12 = 0$  is 6, then other root is  
 A. 2                      B. -2                      C. 3                      D. -3
22. Write the discriminant of the quadratic equation  $Px^2 + qx + r = 0$   
 A.  $q^2 - 4Pr$               B.  $P^2 - 4qr$               C.  $r^2 - 4Pq$               D.  $q - 4Pr$
23. Write the number of tangents that can be drawn to a circle parallel to a given secant  
 A. One                      B. Infinite                      C. two                      D. Four
24. In the figure OP is the radius drawn at the point of contact of tangent PM. If  $\angle OMP = 30^\circ$  then  $\angle POM$  is



- A.  $120^\circ$                       B.  $45^\circ$                       C.  $55^\circ$                       D.  $60^\circ$
25. In the figure O is the centre of circle PA, PB and QR are tangents  $AP = PB = 8$  cm, then perimeter of  $\triangle PQR$  is



- A. 15 cm                      B. 24 cm                      C. 16 cm                      D. 10 cm
26. The angle between the tangents drawn in the figure is  $30^\circ$ . Find the angle between their radii at the centre



- A.  $60^\circ$                       B.  $150^\circ$                       C.  $90^\circ$                       D.  $120^\circ$
27. Given a triangle with side  $AB = 8$  cm to get a line segment  $AB' = \frac{3}{4} AB$ . It required to divide the line segment AB in the ratio  
 A. 3:4                      B. 4:3                      C. 1:3                      D. 3:1

28. The side of a triangle (in cm) are given below. In which case the construction of a triangle is not possible

- A. 8, 7, 3                      B. 8, 6, 4                      C. 8, 4, 4                      D. 7, 6, 5

29. The distance between the points A(0, 5) and B(-5, 0) is

- A.  $5\sqrt{2}$                       B. 25                      C. 50                      D.  $10\sqrt{2}$

30. The coordinates of any point on the y-axis is in the form is

- A. (0, a)                      B. (a, 0)                      C. (-a, 0)                      D. (a, a)

31. The coordinates of the point 'P' which is the equidistant from the line joining  $(x_1, y_1)$  and  $(x_2, y_2)$

- A.  $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$     B.  $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$     C.  $\left(\frac{x_2-x_1}{2}, \frac{y_2-y_1}{2}\right)$     D.  $\left(\frac{x_1+y_1}{2}, \frac{x_2+y_2}{2}\right)$

32. The distance between the origin and the point (-6, 8) is,

- A. 14 units                      B. 10 units                      C. 2 units                      D. -10 units

33. If the surface area of a sphere is equal to its volume then its radius is

- A. 1 unit                      B. 1.5 unit                      C. 2 units                      D. 3 units

34. The formula to find the TSA of a cone of radius 'r' height h and slant height 'l' is

- A.  $2\pi rh(r+h)$                       B.  $\pi r(r+h)$                       C.  $\pi r(r+l)$                       D.  $2\pi r(r+l)$

35. The volume of a cylinder whose base radius is 4cm and height is 14 cm is

- A.  $604 \text{ cm}^3$                       B.  $704 \text{ cm}^3$                       C.  $694 \text{ cm}^3$                       D.  $784 \text{ cm}^3$

36. A metallic solid sphere of radius 9cm is melted to form a solid cylinder of radius 9 cm. The height of the cylinder is

- A. 12 cm                      B. 18 cm                      C. 9 cm                      D. 36 cm

37. A cone is cut by a plane parallel to its base and the upper part is removed. The part that is left over is called.

- A. a cone                      B. a sphere                      C. a cylinder                      D. frustum of a cone

38. Mean of 2, 7, 6 and x is 5. The value of x is

- A. 10                      B. 15                      C. 5                      D. 20

39. The Median and Mode of a frequency distribution are 28 and 16 respectively. The Median is

- A. 22                      B. 23.5                      C. 24                      D. 24.5

40. The Median class for the following data is

Class	20-40	40-60	60-80	80-100
Frequency	10	12	20	22

- A. 20-40                      B. 40-60                      C. 60-80                      D. 80-100