

C-3-C

Roll No.....

Total No. of Questions : 20]

[Total No. of Printed Pages : 7

XBAMKD20

1303-C

MATHEMATICS

Time : 3 Hours]

[Maximum Marks : 10

1. In each of the following write down the correct answer on your answer-book :

(i) A line which intersects a circle in two distinct points is called :

- (A) A Secant
- (B) A Tangent
- (C) A Chord
- (D) None of these

(ii) The value of 'm' for which the quadratic equation $x^2 - 1$
 $+ 4 = 0$ has equal roots is :

- (A) ± 4
- (B) $+4$
- (C) -4
- (D) None of these

XBAMKD20-1303-C

C-3-C

8. Find the value of 'P' for which the given system of equations :

$$2x + 3y - 5 = 0 \text{ and}$$

$$Px - 6y - 8 = 0$$

has a unique solution. 4

9. Find a quadratic polynomial, the sum and product of its zeroes are

$$-\frac{1}{4}, \frac{1}{4} \text{ respectively.} \quad \text{4}$$

10. A die is thrown once, find the probability of getting

(a) A prime number

(b) A number lying between 2 and 6 4

11. Find two numbers whose sum is 27 and product is 182.

Or

Find the roots of the quadratic equation $2x^2 - 7x + 3 = 0$ by the method of completing the square. 6

12. The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

Or

Find the nature of the roots of the quadratic equation $3x^2 + 4\sqrt{3}x + 4 = 0$. If real roots exist, then find them. 6

13. If the areas of two similar triangles are equal, then prove that they are congruent.

Or

Diagonals of a trapezium ABCD with AB parallel to CD intersect each other at point O. If $AB = 2 CD$, find the ratio of the areas of triangles AOB and COD.

6

14. ABC is an equilateral triangle of side $2a$. Find each of its altitudes.

Or

Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

6

15. Find the co-ordinates of a point A, where AB is the diameter of a circle whose centre is $(2, -3)$ and B is $(1, 4)$.

Or

Find the value of 'K' for which the points $(8, 1)$, $(K, -4)$ and $(2, -5)$ are collinear.

6

16. Prove that :

$$\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A$$

(iii) From the letters of the word "MOBILE", a letter is selected. The probability that the selected letter is a vowel is :

(A) $\frac{1}{3}$

(B) $\frac{3}{7}$

~~(C)~~ $\frac{1}{6}$

(D) None of these

1

(iv) Curved surface area of the cylinder is :

(A) Perimeter of the base \times Height

~~(B)~~ Area of the base \times Height

(C) $3 \times$ Area of base

(D) None of these

1

(v) If $x^2 = 0.4$, then 'x' is a :

~~(A)~~ Rational number

(B) Irrational number

(C) Composite number

(D) None of these

1

(vi) If three numbers a, b, c in order are in A.P., then :

(A) $2b = a + c$

(B) $2a = b + c$

(C) $2c = a + b$

~~(D)~~ None of these

1

2. Find the distance between the points $A(-a, -b)$ and $B(a, b)$.

2

3. If $\sin A = \frac{3}{4}$ calculate $\cos A$ and $\tan A$.

2

~~4.~~ Express 156 and 140 as a product of its prime factors.

2

5. AB is the diameter. TB is the tangent to the circle. If Q is a point on TB , then find QA .

4

~~6.~~ Find the 31st term of an A.P. whose 11th term is 38 and the 16th term is 73.

7. Solve the following pair of linear equations by the method of elimination :

$$3x + 4y - 10 = 0$$

$$2x - 2y - 2 = 0$$

Or

If $15 \cot A = 8$, calculate all other trigonometric ratios. 6

17. Evaluate :

$$\frac{5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$$

Or

From a point on the ground, the angles of elevation of the bottom and top of a transmission tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find the height of the tower. 7

18. Construct a triangle with sides 5 cm, 6 cm and 7 cm and then another triangle whose sides are $\frac{7}{5}$ of the corresponding sides of the first triangle. Also write down steps of construction.

Or

Draw a circle of radius 3 cm. Take two points at a distance 7 cm from its centre. Draw tangents to the circle from these two points. Also write down steps of construction. 7

19. Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

Or

Prove that the lengths of tangents drawn from an external point to a circle are equal.

7

20. 2 cubes each of volume 64 cm^3 are joined end to end. Find the surface area of the resulting cuboid.

Or

- A drinking glass is in the shape of a frustum of a cone of height 14 cm. The diameters of its two circular ends are 4 cm and 2 cm. Find the capacity of the glass.

7

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