

**C-3-C**

Roll No.

Total No. of Questions : 20]

[Total No. of Printed Pages : 7

**SSERKDO18**  
**20203-C**  
**MATHEMATICS**

Time : 3 Hours]

[Maximum Marks : 100

**Note :-** Attempt all questions.

1. Choose the correct answer :

(i) If  $x^2 = 0.4$ , then  $x$  is :

- (a) rational number
- (b) an irrational number
- (c) both (a) and (b)
- (d) none of these

(ii)  $-2$  is the zero of the polynomial :

- |                     |                     |
|---------------------|---------------------|
| (a) $x^2 - 7x + 10$ | (b) $x^2 + 7x + 10$ |
| (c) $x^2 - 3x + 2$  | (d) None of these   |

(iii) Which term of the A.P.

72, 63, 54 .....

is 0 ?

(a) 8th

(b) 9th

(c) 10th

(d) None of these

(iv) From a point outside a circle, number of tangents that can be drawn is :

(a) 1

(b) 2

(c) 3

(d) None of these

(v) Total surface area of the cylinder :

(a)  $2\pi rh + 2\pi r^2$

(b)  $2\pi rh$

(c)  $2\pi rh + \pi r^2$

(d) None of these

(vi) The probability of getting 8 in a single throw of a die is :

(a) 0

(b) 1

(c) -1

(d) None of these  $1 \times 6 = 6$

2. From an external point T, a tangent PT is drawn to a circle whose centre is O. If  $OT = 29$  cm and  $PT = 21$  cm, then find the radius of the circle. 2

3. Find the distance between  $(-5, 7)$  and  $(-1, 3)$ . 2

4. Express the trigonometric ratios  $\cos A$  and  $\sec A$  in terms of  $\sin A$ . 2

5. Define algorithm and use Euclid's division algorithm to find the H.C.F. of 867 and 255. 4
6. Find the zeroes of the polynomial  $6x^2 - 3 - 7x$  and also verify the relationship between the zeroes and the co-efficients. 4
7. Find the sum of the odd numbers between 0 and 50. 4
8. Solve the following system of linear equations of cross multiplication method :

$$x - 3y = 3$$

and

$$3x = 9y + 2$$

9. Five years ago Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu ? 4
10. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting :
- (i) a king of red colour
  - (ii) a face card
  - (iii) a spade

11. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.

*Or*

Find the roots of the quadratic equation  $2x^2 - 5x + 3 = 0$  by the method of completing the square. 6

12. Find the discriminant of the quadratic equation  $9x^2 - 6x + 1 = 0$  and hence find the nature of its roots. Find them if they are real.

*Or*

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. 6

13. ABCD is a trapezium in which  $AB \parallel DC$  and its diagonals intersect each other at a point O. Show that :

$$\frac{AO}{BO} = \frac{CO}{DO}$$

*Or*

D, E and F are respectively the mid-points of sides AB, BC and CA of  $\triangle ABC$ . Find the ratio of areas of  $\triangle DEF$  and  $\triangle ABC$ . 6

14. In a triangle if square of one side is equal to the sum of the squares of the other two sides, prove that the angle opposite to the first side is a right angle.

*Or*

PQR is a triangle right angled at P and M is a point on QR such that PM is perpendicular to QR. Show that :

$$PM^2 = QM \cdot MR \quad 6$$

15. Find a relation between  $x$  and  $y$  such that the point  $(x, y)$  is equidistant from the points  $(3, 6)$  and  $(-3, 4)$ .

*Or*

Find the co-ordinates of the points of trisection of the line segment joining  $(4, -1)$  and  $(-2, -3)$ . 6

16. Prove that :

$$\frac{\sin \theta - 2 \sin^3 \theta}{2 \cos^3 \theta - \cos \theta} = \tan \theta$$

( 6 )

*Or*

Given  $\sec \theta = \frac{13}{12}$ . Calculate all other trigonometric ratios.

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17. From a point on the ground, the angle of elevation of the bottom and the top of a transmission tower fixed at the top of a 20 m high building are  $45^\circ$  and  $60^\circ$  respectively. Find the height of the tower.

*Or*

Evaluate :

$$\frac{\sin 30^\circ + \tan 45^\circ - \operatorname{cosec} 60^\circ}{\sec 30^\circ + \cos 60^\circ + \cot 45^\circ}$$

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

*Or*

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

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19. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of  $60^\circ$ .

( 7 )

*Or*

Draw a triangle ABC with sides  $BC = 7$  cm,  $\angle B = 45^\circ$ ,  $\angle A = 105^\circ$ .

Then construct a triangle whose sides are  $\frac{4}{3}$  times the corresponding

sides of  $\triangle ABC$ .

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20. A metallic sphere of radius 4.2 cm is melted and recast into the shape of a cylinder of radius 6 cm. Find the height of the cylinder.

*Or*

A container opened from the top and made up of a metal sheet, is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends 8 cm and 20 cm respectively. Find the cost of the milk which can completely fill the container at the rate of Rs. 20 per litre.

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