

N-3-C

Roll No. ....

Total No. of Questions : 20] [Total No. of Printed Pages : 7 + Graph

XBAWZJ17

13603-C

MATHEMATICS

Time : 3 Hours]

[Maximum Marks : 100

1. In each of the following items there are four answers (a), (b), (c) and (d). Write down the correct/appropriate answer on your answer-book.

(i) HCF of 12, 15, and 21 is :

(a) 3

(b) 4

(c) 5

(d) None of these

(ii) A polynomial equation of degree '4' has exactly :

(a) 1 root

(b) 2 roots

(c) 3 roots

(d) None of these

(iii) The common difference of an A.P.  $3 + \sqrt{2}, 3 + 2\sqrt{2}, 3 + 3\sqrt{2}$  ..... is :

(a)  $3\sqrt{2}$

(b)  $2\sqrt{2}$

(c)  $\sqrt{2}$  ✓

(d) None of these

Turn Over.

XBAWZJ17-13603-C

N-3-C

(iv) A triangle inscribed in a circle and not containing the centre of the circle will always be :

(a) a right angled

(b) an obtuse angled

(c) an acute angled

(d) None of these

(v) Curved surface area of hemisphere is :

(a)  $4\pi r^2$

(b)  $3\pi r^2$

(c)  $2\pi r^2$

(d) None of these

(vi) The probability of a sure event is :

(a) -1

(b) 0

(c) 1

(d) None of these

2. A tangent PQ at a point 'P' of a circle of radius 5 cm meets a line through the centre 'O' at a point 'Q' so that OQ = 12 cm. Find the length PQ.

3. Determine if the points (1, 5), (2, 3) and (-2, -11) are collinear.

4. If  $\tan \theta = 1$ , find  $\cos \theta$ .

5. Check whether  $6^n$  can end with the digit 0 for any natural number 'n'.

( 3 )

Find the zeroes of the quadratic polynomial :

$$6x^2 - 3 - 7x$$

4

Find the sum of the following A.P. :

0.6, 1.7, 2.8 ..... to 100 terms.

4

The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them manages to save Rs. 2,000 per month, find their monthly incomes.

4

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

One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting :

(i) a red face card

(ii) a king of red colour

4

The product of Sunita's age (in years) two years ago and her age four years from now, is one more than twice her present age. What is her present age ?

Or

Solve the general quadratic equation :

$$ax^2 + bx + c = 0 \quad (a \neq 0)$$

6

Turn Over

( 4 )

- Q 12: 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 nature of the roots of the following quadratic equation, also find them :

$$3x^2 - 4\sqrt{3}x + 4 = 0$$

13. The ratio of the areas of the similar triangles is equal to the square of the ratio of their corresponding sides. Prove it.

Or

If AD and PM are medians of triangles ABC and PQR, respectively where  $\Delta ABC \sim \Delta PQR$ , prove that :

$$\frac{AB}{PQ} = \frac{AD}{PM}$$

14. ABC is an equilateral triangle of side '2a'. Find its altitude.

Or

The diagonals of a quadrilateral ABCD intersect each other at the point 'O' such that :

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

Show that ABCD is a trapezium.

XBAWZJ17-13603-C

N-3-C

( 5 )

15. If Q (0, 1) is equidistant from P (5, -3) and R (x, 6), find the value of 'x'.

Or

For what value of 'K' will the points (7, -2), (5, 1) and (3, K) lie on a line ?

16. If  $3\cot A = 4$ , evaluate :

$$\frac{1 - \tan^2 A}{1 + \tan^2 A}$$

Or

Find geometrically the trigonometric ratios of  $45^\circ$ .

17. From the top of a 7 m high building, the angle of elevation of the top of a cable tower is  $60^\circ$  and the angle of depression of its foot is  $45^\circ$ . Determine the height of the tower.

Or

Prove the identity :

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

Turn Over

XBAWZJ17-13603-C

N-3-C

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

Or

Prove that the parallelogram circumscribing a circle is a rhombus.

19. Draw a triangle ABC with side  $BC = 7$  cm,  $\angle B = 45^\circ$ ,  $\angle A = 105^\circ$ .  
Then construct a triangle whose sides are  $\frac{4}{3}$  times the corresponding sides of  $\triangle ABC$ .

(Steps of construction are required).

Or

Draw a circle of radius 6 cm. From a point 10 cm away from its centre, construct the pair of tangents to the circle.

(Steps of construction are required).

20. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter, the diameter of the spherical part is 8.5 cm. Find the volume of water it can hold. (Take  $\pi = 3.14$ )

( 7 )

Or

How many silver coins, 1.75 cm in diameter and of thickness 2 mm must be melted to form a cuboid of dimensions 5.5 cm  $\times$  10 cm  $\times$  3.5 cm ?

7

XBAWZJ17—13603—C

N-3-C