A–3–Y

Roll No.....

Total No. of Questions : 20] [Total No. of Pages

XKDARO/N19

24603–Y

MATHEMATICS

Time : 3 Hours] [Maximum Marks : 100

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

(i) H.C.F. of 26 and 91 is :

(A) 14 (B) 26

(C) 182 (D) 13

(ii) Zeroes of the quadratic polynomial $x^2 - 2x - 8$ are :

(A) 2, –4 (B) –2, 4

(C) –2, –4 (D) 2, 4

Turn Over

(iii) 8th term of an A.P

10, 7, 4, ...

is :

(A) -17 (B) -8

(C) -10 (D) -11

(iv) A card is drawn from a pack of 52 cards. What is the probability of getting a king ?

(A) $\frac{1}{4}$ (B) $\frac{1}{13}$

(C) $\frac{1}{2}$ (D) $\frac{1}{26}$

(v) Volume of a right circular cone is :

(A) $\frac{4}{3}\pi r^3$ (B) $\frac{1}{3}\pi r^2 h$

(C) πrl (D) $\pi r^2 h$

(vi) The number of tangents to a circle drawn from a point outside the circle is :

(A) 1 (B) 2

(C) 3 (D) Infinite

2. Evaluate :

$$\frac{\tan 65^\circ}{\cot 25^\circ}$$

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

4. From a point 'Q', the length of the tangent to a circle is 24 cm and the distance of 'Q' from the centre is 25 cm. Find the radius of the circle. 2

5. In an A.P., $a = 2$, $d = 8$, $S_n = 90$. Find 'n' and a_n 4

6. Given that H.C.F. (306, 657) = 9. Find L.C.M. 4

7. The sum of the digits of two-digit number is 9. Also nine time this number is twice the number obtained by reversing the order of the digits. Find the number. 4

8. Solve the following pair of linear equation by elimination method

$$3x + 4y = 10 \text{ and } 2x - 2y = 2$$ 4

9. Divide :

$$x^4 - 3x^2 + 4x + 5 \text{ by } x^2 + 1 - x$$ 4

10. A die is thrown once. Find the probability of getting :

(i) a prime number

(ii) an even number

(iii) an odd number

(iv) a number lying between 2 and 6 4

11. Find the roots of the quadratic equation $2x^2 + x - 4 = 0$ by the method of completing the square.

Or

Find the value of k for the quadratic equation $2x^2 + kx + 3 = 0$, so that it has two equal roots. 6

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

The diagonal of a rectangular field is 60 meters more than the shorter side. If the longer side is 30 meters more than the shorter side. Find the sides of the field. 6

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

Or

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

$$\frac{AO}{BO} = \frac{CO}{OD}$$ 6

14. BL and CM are the medians of a triangle ABC. right angled at A. Prove that :

$$4(BL^2 + CM^2) = 5BC^2$$

Or

D and E are the points on the sides CA and CB respectively of a triangle ABC right angled at C. Prove that $AE^2 + BD^2 = AB^2 + DE^2$. 6

15. Find the ratio in which line segment joining A (1, –5) and B (–4, 5) is divided by the X-axis. Also find the co-ordinates of the point of division.

Or

Find the area of the quadrilateral whose vertices, taken in order are (–4, –2), (–3, –5), (3, –2) and (2, 3). 6

Turn Over

16. If $\sin 3A = \cos (A - 26°)$, where $3A$ is an acute angle, find 'A'.

Or

Prove that :

$$\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A$$ 6

17. The angles of depression of the top and the bottom of an 8 meters tall building from the top of a multi-storeyed building are 30° and 45° respectively. Find the height of multi-storeyed building and the distance between two buildings.

Or

Prove that :

$$\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \text{cosec } A + \cot A$$ 7

18. Prove that the parallelogram circumscribing a circle is a Rhombus.

Or

Two concentric circles are of radius 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle. 7

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

Or

Draw a circle of radius 6 cm. From a point 10 cm away from its centre, construct a pair of tangents to the circle and measure their lengths. 7

20. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of a toy is 15.5 cm. Find the total surface area of the toy.

Or

The slant height of a frustum of a cone is 4 cm and the perimeters (circumferences) of its two circular ends are 18 cm and 6 cm. Find the curved surface area of the frustum. 7