

A-3-Z

Roll No.

Total No. of Questions : 20]

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XKDARO/N19

24603-Z

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 6 and 20 is :

- (a) 2
- (b) 5
- (c) 120
- (d) 18

(ii) Zeroes of the quadratic polynomial $4x^2 + 8x$ are :

- (a) 0, 2
- (b) 0, - 2
- (c) 2, 0
- (d) 0, 4

(iii) 7th term of all A.P.

10, 7, 4, is :

- (1) - 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 heart?

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

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

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

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

(v) Volume of sphere is :

(A) $\frac{4}{3}\pi r^3$

(B) $\frac{2}{3}\pi r^3$

(C) $2\pi rh$

(D) $\frac{3}{4}\pi r^3$

(vi) How many tangents can a circle have ?

(A) 1

(B) 2

(C) 3

(D) Infinite

2. Evaluate :

$$\frac{\tan 26^\circ}{\cot 64^\circ}$$

3. Find a point on Y-axis which is equidistant from the points (6, 5) and (-4, 3).

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 radius of the circle.

5. How many three digit numbers are divisible by 7.

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

7. The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2. <https://www.jkboseonline.com>

Find the number. How many such numbers are there?

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

$$x + y = 5, 2x - 3y = 4$$

9. Divide :

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

10. A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be :

(i) Red

(ii) White

(iii) Red or white

(iv) Not green

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.

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.

13. Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides. <https://www.jkboseonline.com>

Or

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

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 $AE^2 + BD^2 = AB^2 + DE^2$.

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).

16. If $\sin 34 = \cos (A - 26^\circ)$. where $3A$ is an acute angle, find 'A'.

Or

Prove that :

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

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.

Prove that:

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

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.

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 $\frac{4}{5}$ 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.

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.