

C-3-A

Roll No.....

Total No. of Questions : 20]

[Total No. of Printed Pages : 7

XBAMKD20

1303-A

MATHEMATICS

Time : 3 Hours]

[Maximum Marks : 100

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

(i) The exponent of 2 in the prime factorisation of 144 is :

(A) 4

(B) 5

(C) 6

(D) None of these

1

(ii) The next term of an A. P. $\sqrt{7}, \sqrt{28}, \sqrt{63}$ is :

(A) $\sqrt{70}$

(B) $\sqrt{84}$

(C) $\sqrt{98}$

(D) None of these

1

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Turn Over

C-3-A

(2)

(iii) Which of the following pairs of lines in a circle cannot be parallel ?

- (A) Two chords
- (B) Two diameters
- (C) A chord and tangent
- (D) None of these

1

(iv) Total surface area of a cone is :

- (A) $\pi r l + 2\pi r^2$
- (B) $\pi r l + \pi r^2$
- (C) $2\pi r h$
- (D) None of these

1

(v) If a digit is chosen at random from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9, then the probability that it is an odd is :

- (A) $\frac{4}{9}$
- (B) $\frac{5}{9}$
- (C) $\frac{1}{9}$
- (D) None of these

1

(vi) The zeros of the quadratic polynomial $x^2 + 7x + 10$ are :

(A) 5, -2

(B) -2, -5

(C) 2, 5

(D) None of these

1

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

3. Express the Trigonometric ratio's $\sin A$ and $\tan A$ in terms of $\sec A$. 2

4. Use Euclid's division algorithm to find the H.C.F. of 135 and 225.

5. If TP and TQ are the two tangents to a circle with centre O such that $\angle POQ = 110^\circ$, then find $\angle PTQ$.

6. If the 3rd and 9th terms of an A.P. are 4 and -8 respectively, then which term is zero. 4

7. Solve the following pair of linear equations by the method of cross-multiplication :

$$2x + y - 5 = 0$$

$$3x + 2y - 8 = 0$$

4

8. The difference between two numbers is 26 and one number is three times the other. Find them. 4
9. Divide $x^3 - 3x^2 + 5x - 3$ by $x^2 - 2$ and write the quotient and remainder. 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

(5)

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. <https://www.jkboseonline.com>

6

16. Prove that :

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

(6)

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

(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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