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Total No. of Questions: 20]

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## XBAMKD20 1303–C MATHEMATICS

Time: 3 Hours

[Maximum Marks: 100

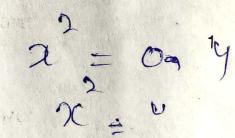
- 1. In each of the following write down the correct answer on your answer-book:
  - (i) A line which intersects a circle in two distinct points is called:
    - (A) A Secant
    - (B) A Tangent
    - (C) A Chord
    - (D) None of these
  - (ii) The value of 'm' for which the quadratic equation  $x^2 mx + 4 = 0$  has equal roots is:
    - (A) ±4
    - (B) +4
    - (C) -4

- $\chi^2 m > L + 4 = 6$   $\chi^2 m \times$
- (D) None of these

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- (iii) From the letters of the word "MOBILE", a letter is selected. The probability that the selected letter is a vowel is:
  - (A)  $\frac{1}{3}$
  - (B)  $\frac{3}{7}$
  - (C)  $\frac{1}{6}$
  - (D) None of these
- (iv) Curved surface area of the cylinder is:
  - (A) Perimeter of the base × Height.
  - (B) Area of the base × Height
  - (C)  $3 \times \text{Area of base}$
  - (D) None of these
- (v) If  $x^2 = 0.4$ , then 'x' is a :
  - (A) Rational number
  - (B) Irrational number
  - (C) Composite number
  - (D) None of these



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(vi) If three numbers a, b, c in order are in A.P., then:

$$(A) 2b = a + c$$

(B) 
$$2a = b + c$$

(C) 
$$2c = a + b$$

- (D) None of these
- 2. Find the distance between the points A(-a, -b) and B(a, b).
- 3. If  $\sin A = \frac{3}{4}$ , calculate  $\cos A$  and  $\tan A$ .
- 4. Express 156 and 140 as a product of its prime factors.
- 5. AB is the diameter. TB is the tangent to the circle. If Q is a point on TB, then find QA.
- 6. Find the 31<sup>st</sup> term of an A.P. whose 11<sup>th</sup> term is 38 and the 16<sup>th</sup> term is 73.
- 7. Solve the following pair of linear equations by the method of elimination:

$$3x + 4y - 10 = 0$$

$$2x - 2y - 2 = 0$$

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8. Find the value of 'P' for which the given system of equations :

$$2x + 3y - 5 = 0$$
 and

$$Px - 6y - 8 = 0$$

has a unique solution.

Find a quadratic polynomial, the sum and product of its zeroes are

$$-\frac{1}{4}, \frac{1}{4}$$
 respectively.

A die is thrown once, find the probability of getting:

- (a) A prime number
- (b) A number lying between 2 and 6

Find two numbers whose sum is 27 and product is 182.

Find the roots of the quadratic equation  $2x^2 - 7x + 3 = 0$  by the method of completing the square.

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.

Find the nature of the roots of the quadratic equation 
$$3x^2 + 4\sqrt{3}x + 4 = 0$$
. If real roots exists, then find them.

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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.

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.

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.

16. Prove that :

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

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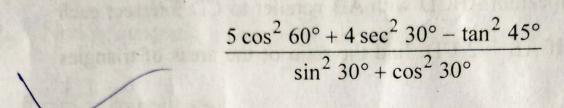
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Or

If 15 cot A = 8, calculate all other trigonometric ratios.

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## 17. Evaluate:



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.

3. 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.

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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.

20. 2 cubes each of volume 64 cm<sup>3</sup> 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.

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