KARNATAKA SECONDARY EDUCATION EXAMINATION BOARD

Malleswaram, Bangalore

MODEL QUESTION PAPER FOR THE YEAR 2019-20

Subject: Mathematics **MODELPAPER –1** **Subject code -81E**

Time:3 hours 15minutes **(Private fresh)** **Maximum marks: 100**

I. In the following questions, four choices are given for each question, choose and write the correct answer along with its alphabet: **1x8=8**

1. In the following numbers, irrational number is

   A) $\sqrt{16}-\sqrt{9}$ B) ¾ C) 0.3333..... D) $2+\sqrt{3}$

2. If Sin A = $\frac{1}{\sqrt{2}}$, the magnitude of $\angle$ A is

   A) 90^0 B) 60^0 C) 30^0 D) 45^0.

3. The maximum number of tangents that can be drawn to a circle from an external point is

   A) 1 B) 2 C) 3 D) 4

4. The formula used to find the curved surface area of a cone of radius (r), height (h) and slant height (l) is

   A) CSA = π rl B) CSA = 2 π (r+l) C) CSA = 2πr(r+h) D) CSA = $\frac{\pi r^2 h}{3}$

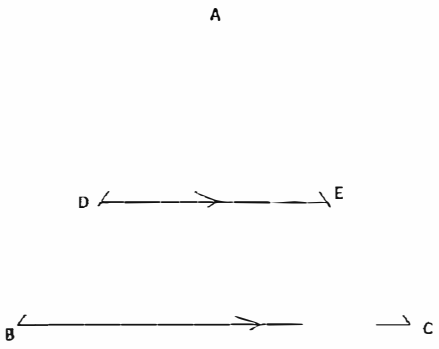
5. If one of the zeros of the polynomial $p(x) = x^2 - x + k$ is 2 then the value of k is

   A) 2 B) -2 C) -6 D) 6

6. The 10^{th} term of an A.P. 5,9,13, ... is

   A) 36 B) 31 C) 41 D) 21

7. In the given Δ ABC, DE || BC. If DE = 5cm, BC = 8cm and AD = 3.5cm, then the length of AB is



   A)5.6cm B) 4.8cm C) 5.2cm D) 6.4 cm

8. The probability of an event ` E` is 0.05, then the probability of an event ` Not E` is

   A) 0.05 B) 0.95 C) $\frac{1}{0.05}$ D) $\frac{1}{0.95}$

II. Answer the following questions: **1x8 =8**

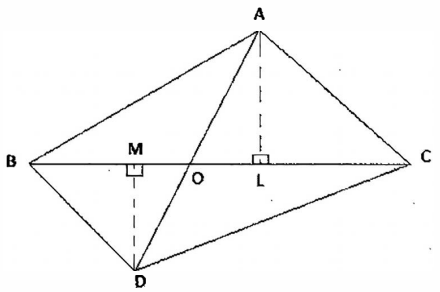
9. Write the number of zeros of the polynomial $p(x) = x^3 + 2x^2 + x + 6$.
10. Write the 'discriminant' of the quadratic equation $ax^2 + bx + c = 0$.
11. If the first term and the common difference of an A.P. are 6 and 5 respectively, find its 3^{rd} term .
12. State Basic proportionality theorem.
13. In Euclid`s division lemma , if $a = 3q + r$, then write all the possible values of r.
14. If $\text{Sin } \theta = \frac{3}{5}$ and $\cos \theta = \frac{4}{5}$, find the value of $\sin^2\theta + \cos^2\theta$.
15. Find the value of $\sin 30^0 + \cos 60^0$.
16. A solid piece of iron is in the form of a cuboid of dimensions 10cm x 5cm x 2cm. Find its volume.

III. Answer the following: **2x18 =36**

17. P.T. $\sqrt{2} + \sqrt{3}$ is an irrational number.
18. Solve: $10x + 3y = 75$ and $6x - 5y = 11$
19. Find the roots of the equation $6x^2 + 7x - 10 = 0$
20. Find the distance between the points A(8,-3) and B (0,9) by using distance formula.
21. The perimeters of two similar triangles are 25cm and 15cm. If one side of the first the first triangle is 9cm, find the corresponding side of the second triangle.

OR

In the given figure Δ ABC and ΔDBC are on the same base BC . AD intersects BC at `O`. If AL ⊥BC and DM ⊥BC , prove that $\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta DBC} = \frac{AO}{DO}$



22. Two cubical dice whose faces are numbered 1 to 6 are rolled simultaneously once. Find the probability that the sum of the two numbers occurring on their top faces is more than 7.

23. Draw a circle of radius 3cm. Construct a pair of tangents to it,from a point 8cm away from its center.

24. If $\cos\theta = 0.6$ show that $5\sin\theta - 3\tan\theta = 0$.

OR

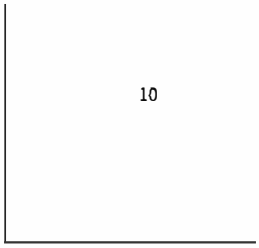
P.T. $(\sec^4\theta - \sec^2\theta) = \tan^2\theta + \tan^4\theta$.

25. Find the H.C.F. and L.C.M. of 24, 36 and 40 by prime factorization method.

26. Find the nature of the roots of the quadratic equation $4x^2 - 5x + 3 = 0$.

27. Find the sum of first 24 terms of the Arithmetic progression 5,8,11,14, ...

28. In the triangle ABC, $\angle B = 90^0$, AB = 6 units and AC = 10 units, then find the value of cos C.



29. The co-ordinates of one end of the diameter of a circle is (4,-1) and the co-ordinates of the centre of the circle is (1,-3). Find the co-ordinates of the other end of the diameter.

30. A cone of height 24cm and radius of base 6cm is made of Wax. It is melted and recast into the shape of a sphere. Find the radius of the sphere.

31. Find the area of a sector of a circle of radius 6cm and angle of the sector is 60^0.

32. Draw a pair of tangents to a circle of radius 5cm which are inclined to each other at an angle of 60^0.

33. Find the mean of the following data:

X = 25,28,45,30 and 37.

34. Draw a line AB = 8cm and divide it in the ratio 3:5.

IV. Answer the following: **3 x 9 =27**

35. The sum of the numerator and the denominator of a given fraction is 12. If 3 is added to its denominator, the fraction becomes ½ . Find the given fraction.

OR

Seven times a two digit number is equal to four times the number obtained by reversing the places of its digits. If the difference between the digits is 3, find the number.

36. If 3 and -3 are two zeros of the polynomial p(x) $x^4 + x^3 - 11x^2 - 9x + 18$, then find the remaining two zeros of the polynomial.

37. The sum of the areas of two squares is 640 m^2. If the difference between their perimeters is 64m, then find sides of the square.

OR

If the roots of the equation $(a^2 + b^2)\,x^2 + 2(bc - ad)x + c^2 + d^2 = 0$ are equal, show that $ac + bd = 0$.

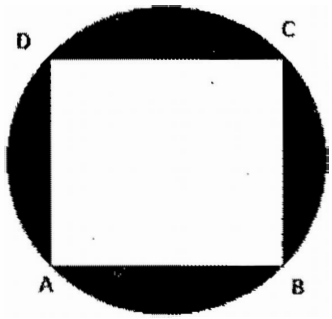
38. Find the ratio in which the point P(2,x) divides the line joining the points A(-2,2) and B(3,7) internally. Also find the value of x.

OR

Find the area of that triangle formed by joining the mid-points of the sides of the triangle whose vertices are A (2,3) B =(4,4) and C (2,6)

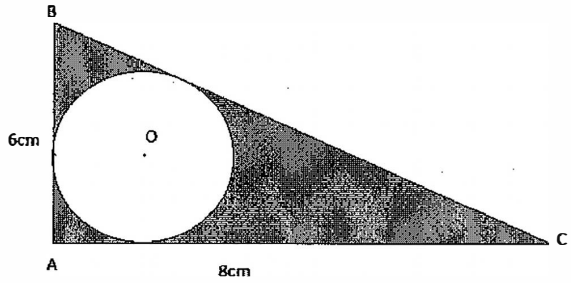
39. Prove that the tangents drawn to a circle from the external point are equal..

40. In the figure ABCD is a square, whose vertices lie on the circle. Find the area of the shaded region, if the perimeter of the circle is 88cm.



OR

Δ ABC is right angled at A. The sides AB, BC and AC are the tangents to the circle with centre `O` as shown in the figure. If AB = 6cm, BC = 8cm, then find the area of the shaded region.



41. The following table gives the production yield per hectare of wheat of 100 farms of a village. Draw more than type Ogive

Yield productivity	40-45	45- 50	50-55	55-60	60-65	65-70
Number of farms	4	6	16	20	30	24

42. Find the mean of the following data:

C.I.	0-10	10-20	20-30	30-40	40-50
frequency	3	5	9	5	3

43. Draw a triangle ABC with side base BC = 8cm and altitude 4cm, and then construct another triangle whose sides are $\frac{5}{3}$ times the corresponding sides of the isosceles triangle ABC.

V.Answer the following **4x 4 =16**

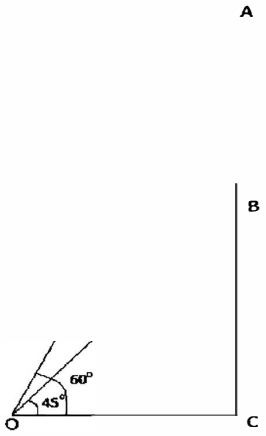
44. Solve the pair of linear equations graphically: x – 2y =0 and 3x + 4y = 20

45. The pth, qth and rth term of an A.P. are a,b and c respectively. Prove that a(q-r) + b(r-p)+ c(p-q) = o.

OR

The sum of the first three terms of an A.P. is 33. If the product of the first term and third term exceeds the 2nd term by 29. Find the A.P.

46. The angle of elevation of the top of an unfinished verticle building on a ground at a point which is 100m from the base of the building is 45^0.how much height the building must be raised, so that its angle of elevation from the same point be 60^0.(Take $\sqrt{3}$= 1.73)



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

V Answer the following: **5X1=5**

48. A cone of radius 10cm is cut into two parts by a plane through the mid-point of its vertical axis parallel to the base. Find the ratio of the volume of the smaller cone to the frustum of the cone.