ANANDALAYA
ANNUAL EXAMINATION
Class : IX

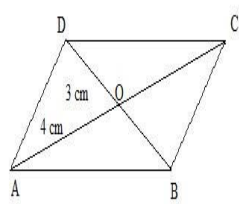|	
Subject: Mathematics	M.M: 80
Date : 14/02/2020	Time: 3 Hours

General Instructions:
(i) All the questions are compulsory.
(ii) The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
(iii) Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
(iv) There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
(v) Use of calculators is not permitted
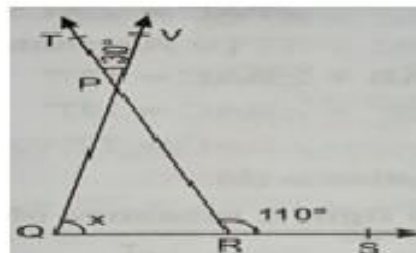
SECTION-A

Q. 1 – Q 10 are multiple choice questions. Select the most appropriate answer from the given options.

1. The probability of happening of an event is 45%. The probability of an event is____. (1)
   (a) 45   (b) 4.5   (c) 0.45   (d) 0.045

2. In continuous frequency distribution, class mark of a class is 85 and lower limit is 83, then its upper limit is _____. (1)
   (a) 86   (b) 84   (c) 83   (d) 87

3. Two sides of a triangle are 8 cm and 11 cm and perimeter of triangle is 32. Then value of 's' is___. (1)
   (a) 19 cm   (b) 20 cm   (c) 21.5 cm   (d) 16 cm

4. Given a circle with centre O and smallest chord AB is of length 3 cm, longest chord CD is of length 10 cm and chord PQ is of length 7 cm, then radius of the circle is ____. (1)
   (a) 1.5 cm   (b) 6 cm   (c) 5 cm   (d) 3.5 cm

5. In the given figure, ABCD is a rhombus, AO = 4 cm and DO = 3 cm. Then the perimeter of the rhombus is ____. (1)

   (a) 18 cm   (b) 20 cm   (c) 21 cm   (d) 22 cm

6. Two angles measures $x - 40°$ and $140° - 2x$. If each one is opposite to equal sides of an isosceles triangles, then the value of x is_____. (1)
   (a) 90°   (b) 0°   (c) 45°   (d) 60°

7. If P (– 1, 1), Q (3, – 4), R (1, – 1), S (– 2, – 3)and T (– 4, 4) are plotted on the graph paper, then the point(s) in the fourth quadrant are_____. (1)
   (a) P and T   (b) Q and R   (c) only S   (d) P and R

8. If two complementary angles are in the ratio 13 : 5, then the angles are ____ and _____. (1)
   (a) 65°, 35°   (b) 65°, 25°   (c)13°, 5°   (d) 60°, 30°

9. Given a polynomial $p(t) = t^4 - t^3 + t^2 + 6$, then $p(-1)$ is_____. (1)
   (a) 6   (b) 9   (c) 3   (d) –1

10. $2 - \sqrt{7}$ is_____. (1)
    (a) a rational number   (b) an irrational number   (c) an integer   (d) a natural number

(Q 11 – Q 15) Fill in the blanks

11. In the given figure, value of $\angle x$ is _____. (1)

12. If the point (2, 3) lies on the graph of the equation 3y = ax + 7, then the value of a = _____. (1)

OR

The graph of the linear equation 3x + 5y = 15 cuts the x – axis at _____ the point.

13. The equation of line parallel to x – axis is of the form _____. (1)

14. If $x + y + z = 0$ then value of $x^3 + y^3 + z^3 =$ _____. (1)
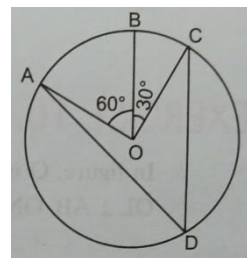
15. $(16)^{\frac{3}{4}}$ is equal to _____ (1)

(Q 16 – Q 20) Answer the following

16. It is given that $\Delta ABC \cong \Delta FDE$ and AB = 6 cm, $\angle B = 80°$ and $\angle A = 40°$, what is the value of $\angle E$? (1)

17. In parallelogram ABCD, AB = 8 cm and the altitudes corresponding to sides AB and AD are DM = 6 cm and BN = 10 cm respectively. Find the value of AD. (1)

18. What is the formula for lateral surface area of a cuboid with dimensions l, b, h? (1)

OR

Find the lateral surface area of cube, if its diagonal is $\sqrt{6}$ cm.

19. In a family with two sons, a father has a field in the form of a right angled triangle with sides 18 m and 40 m. He wants to give independent charge to his sons, so he divided the field in the ratio 2:1:1, the bigger part he kept for himself and divided remaining equally among the sons, find the total area distributed to the sons. (1)

20 In the figure A, B and C are three points on a circle with centre O such that $\angle BOC = 30°$ and $\angle AOB = 60°$. If D is a point on the circle other than the arc ABC, find $\angle ADC$. (1)

SECTION-B

21. The following observations have been arranged in ascending order. If the median of the data is 23.5, find the value of x. (2)

         12,   16,   17,   19, x, $x + 3$,   27,   37,   38,   40

22. Find the distance of the following points; (2)
    (i) A(3, 4) and B (2, – 5) from x – axis.
    (ii) P (– 2, 2)and Q (6, 7) from y – axis.

23. A die is rolled 300 times and following outcomes are recorded: (2)

Outcomes	1	2	3	4	5	6
Frequency	42	60	55	53	60	30

Find the probability of getting a number (i) more than 4 (ii) less than 3.

OR

A parent has collected data of number of schools based on the monthly fees, so that he can choose the school for admission of this child. The data is as follows:

Monthly fees of schools (in`)	Number of schools
250 - 500	14
500 - 750	16
750 - 1000	18
1000 - 1250	12
1250 - 1500	14
1500 - 1750	8
1750 - 2000	8

If a school is selected at random, find the probability that the school is having;
(i) fees less than ` 1000          (ii) fees `1000 or more but less than ` 1500.

24. Factorise: $6x^2 + 5x – 6$ (2)

25. Evaluate : $\left(\frac{32}{243}\right)^{-\frac{4}{5}}$. (2)

OR

If $x = 3 + 2\sqrt{2}$, then find whether $x + \frac{1}{x}$ is rational or irrational.

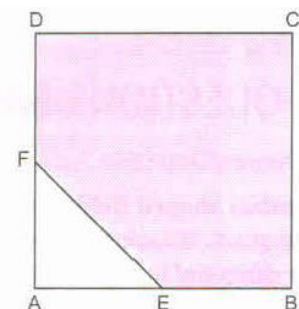26. Find the remainder when $4x^3 - 3x^2 + 4x - 2$ is divided by $x - 2$. (2)

SECTION-C

27. If 2x + 3y = 12 and xy = 6, find the value of $8x^3 + 27y^3$. (3)

OR

Divide $3y^4 - 8y^3 - y^2 - 5y - 5$ by $y - 3$ and find the quotient and the remainder.

28. In the given figure, ABCD is a square of side 4 cm. E and F are mid – points of AB and AD reapectively. Find the area of the shaded region. (3)

29. Prove that 'If two lines intersect each other, then the vertically opposite angles are equal.' (3)

OR

Prove that ' The sum of the angles of a triangle is 180°.

30. A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps. (3)
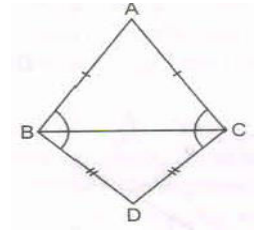
31. Prove that the line segment joining the midpoints of two equal chords of a circle make equal angles with the chords. (3)

32. Draw any acute angle. Divide it into four equal parts using a ruler and compass. Measure them using protractor. (3)

OR

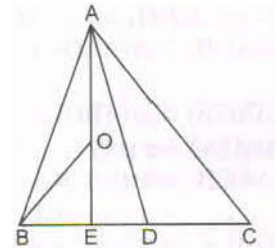Construct a triangle XYZ in which ∠ Y = 30°, ∠ Z = 90° and XY + YZ + ZX = 11 cm.

33. ABC and DBC are two isosceles triangles on the same base BC (see fig.) Show that ∠ABD = ∠ACD. (3)

34. For what value of p; x = 2 , y = 3 is a solution of (p + 1) x – (2p + 3)y – 1 = 0? (3)
(i) Write the equation.
(ii) How many solutions of this equation are possible?

SECTION-D

35. D is the midpoint of side BC of ΔABC and E is the midpoint of BD. If O is the midpoint of AE, then prove that, $8 \times ar(\Delta BOE) = ar(\Delta ABC)$ (4)

OR

XY is a line parallel to side BC of a triangle ABC. If BE∥AC and CF ∥ AB meet XY at E and F respectively, show that ar(ABE) = ar(ACF).

36. A right truangle ABC with sides 5 cm, 12 cm, and 13 cm is revolved about the side 12 cm. Find the volume of the solid so obtained and if it is revolved about the side 5 cm, then find the volume of the solid so obtained. Also find the ratio of the two solids obtained. (4)

37. Prove that 'A diagonal of a parallelogram divides it into two congruent triangles'. (4)

OR

Prove that "The bisectors of angles of a parallelogram form a rectangle'.

38. Draw a histogram for the following marks obtained (out of 100 marks) by class 80 students. (4)

Marks	10 – 20	20 – 30	30 – 50	50 – 60	60 – 80
Number of students	18	16	15	17	14

OR

Below are the marks obtained by 30 students of a class in Maths test out of 100. Make a frequency distribution table for this data with class interval of size 10 and draw a histogram to represent the data.

57,   61,   46,   99,   76,   90,   77,   60,   47,   55,
66,   59,   60,   78,   55,   88,   60,   37,   58,   83,
61,   49,   52,   51,   56,   98,   67,   70,   37,   67

39. If x is a positive real number and the exponents are rational numbers, then simplify: (4)

$$\left(\frac{x^b}{x^c}\right)^{b+c-a} \times \left(\frac{x^c}{x^a}\right)^{c+a-b} \times \left(\frac{x^a}{x^b}\right)^{a+b-c}$$

40. The taxi fare in a city is as follows: For the first kilometer, the fare is ` 8 and for the subsequent distance it is ` 5 per km. Taking the distance covered as x km and total fare as ` y, write a linear equation for this information, and draw its graph. (4)