Time: 3Hrs   M.M:80

General Instructions:

1.   This question paper has 5 sections. (A, B, C, D, E)

2.   Section A has 20 MCQs carry 1 mark each.

3.   Section B has 5 questions carry 2 marks each.

4.   Sector C has 6 questions carry 3 marks each.

5.   Sector D has 4 questions carry 5 marks each.

6.   Section E has 3 case based questions carry 4 marks each.

7.   All questions are compulsory. Internal choices in 2 questions of 5 marks, 2 question s of 3 marks and 2 questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section-E.

SECTION-A

Section A consists of 20 question of 1 mark each. Select the most appropriate option from the given options.

1. $\sqrt{10} \times \sqrt{15} =$

(a) $6\sqrt{5}$ (b) $5\sqrt{6}$ (c) $\sqrt{25}$ (d) $10\sqrt{5}$

2.   Which one of the following is a rational number:

(a) $\sqrt{3}$ (b) 0.121221222..... (c) π (d) 0

3.   Decimal representation of a rational number cannot be:

(a) Terminating   (b)Non-terminating

(c) Non-terminating repeating

(d) Non-terminating non-repeating

4. $x^3 - 27 =$

(a) $(x+3)(x^2-3x+9)$ (b) $(x-3)(x^2-3x+9)$

(c) $(x-3)(x^2+3x+9)$ (d)$(x-3)(x^2-3x-9)$

5.   If B lies between A and C , AC = 10 cm , BC= 4 cm then AB=

(a) 16 cm   (b) 100 cm   (c) 36 cm   (d) 6 cm

6.   Euclid stated that all right angles are equal to each other in the form of

(a) An axiom   (b) A definition   (c) a postulate   (d) a proof

7. Two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2:3, then the smaller of the two angles is:

    (a) 54^0 (b)108^0 (c) 136^0 (d)72^0

8. The side of an equilateral triangle whose area $16\sqrt3$ cm2 is:

    (a) 8cm   (b) 4 cm   (c)16cm   (d) 64 cm

9. The sides of a triangle is x cm, x cm and 2x cm then its semi-perimeter is:

    (a) x cm   (b) 4x cm   (c) 2x cm   (d) 3x cm

10. Abscissa of all the points on y axis:

    (a) 1   (b) 0   (c)-1   (d) any rational number

11. The sides of a triangle are 7 cm, 9 cm and 14 cm. Its area is

    (a)125 sq.cm   (b) 1232sq.cm   (c) 245 sq.cm(d) 63 sq.cm

12. Ordinate of all points on the x-axis is

    (a) 0   (b) 1   (c) Any number   (d) none of these

13. The value of k for which the polynomial x^3-3x^2+3x+k has 3 as its zero is:

    (a) -3   (b) 9   (c) -9   (d)1

14.The value of 249^2-248^2 is

    (a) 12   (b) 477   (c) 487   (d) 497

15.For two triangles, if two angles and the included side of one triangle are equal to two angles and the included side of another triangle. Then the congruency rule is:

    a). SSS   (b). ASA   (c) SAS   (d) None of the above

16. If Δ ABC $\cong$ Δ PQR, then which of the following is not true?

    (a) AC = PR   (b) BC = PQ   (c) QR = BC   (d) AB = PQ

17. The coefficient of x in $(x-3)^2$ is :

    (a) 1   (b) 3   (c) -6   (d) 6

18. The value of $(64/25)^{-3/2}$ is :

    (a) 8/5   (b) 5/8   (c) 512/125 (d) 125/ 512

The following questions consist of two statements- Assertion (A) and Reason (R) . Answer these questions selecting appropriate option given below :

19. Assertion (A) : Given two distinct points there is a unique line passing through that unique point.

    Reason (R) : If P,Q ,R are three points on aline such that Q lies between P and R then PQ+QR= PR.

    (a) Both A and R are are true and R is the correct explanation for A .

    (b) Both A and R are true and R is not the correct explanation for A.

    (c) A is true but R is false.

    (d) A is false but R is true .

20. Assertion (A) : The points (2,-7) and (-7,2) are at different positions in the coordinate plane.

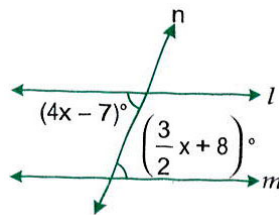Reason (R) : If x is not equal to y then (x,y) is not equal to (y,x)

21. Expand $(3a-7b-4c)^2$

OR

If $x+y =12$ and $xy=27$, then find the value of $x^3+ y^3$

22. If a point C lies between two points A and B such that AC=BC, then prove that AC = ½ AB. Draw figure also.

23. Find x in the given fig. If l is parallel to m.

24. If $p(x) = 5x-4x^2 +3$ find p(0) + p(1)

25. Find the values of x and y if (x+5,2y +3) = (9,6)

OR

A point lies on the x-axis at a distance of 17 units from the y-axis. Write its coordinate and also what are its coordinates if it lies on y-axis at a distance -9 units from the x-axis?

26. It is given that $\angle XYZ=64^0$ and XY is produced to point P. Draw a figure from the given information. If ray YQ bisects $\angle ZYP$, find $\angle XYQ$ and reflex $\angle QYP$.

27. Two sides of a triangle are 88 m and 114 m . If its perimeter is 320 m, find its area.

OR

An umbrella is made by stitching 10 triangles pieces of cloth of two different colour, each piece measuring 20 cm 50 cm and 50 cm. How much cloth of each colour is required for the umbrella?

28. Represent Root 5 on number line and justify it.

29. In the Figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that $\angle ROS = 1/2(\angle QOS – \angle POS)$.
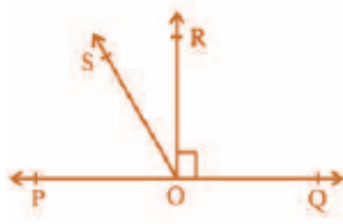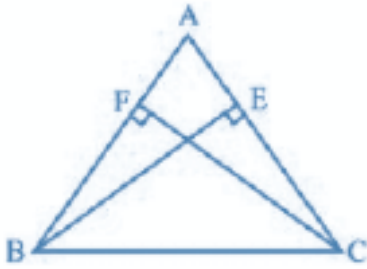

30. Factorize :

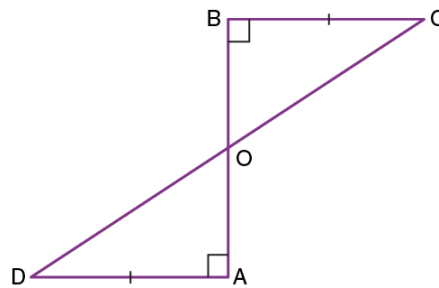(i) $x^3+ 3x^2 + 3x - 63$

(ii) $2x^5 + 432 x^2y^3$

31. ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively. Show that these altitudes are equal.

OR

AD and BC are equal perpendiculars to a line segment AB. Show that CD bisects AB.
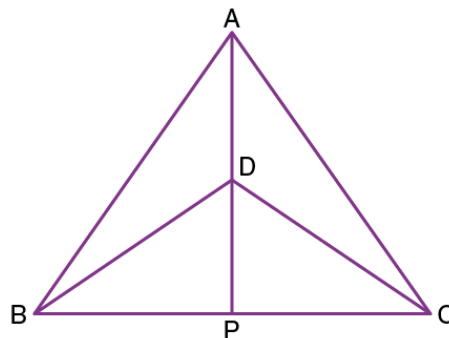

SECTION -D(5 Marks each)

32. If a=5+2√6 and b= 1/a ,then find a ^{2}+b ^{2}.

OR

If $x = \dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $y = \dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find the value of $x^2 + y^2 + xy$.

33. The side of a triangular field is 52m, 56m, and 60m find the cost of levelling the field Rs 18 per meter, if a space of 4cm is to be left for entry gate.

34. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (see the figure). If AD is extended to intersect BC at P, show that

    (i) ΔABD ≅ ΔACD

    (ii) ΔABP ≅ ΔACP

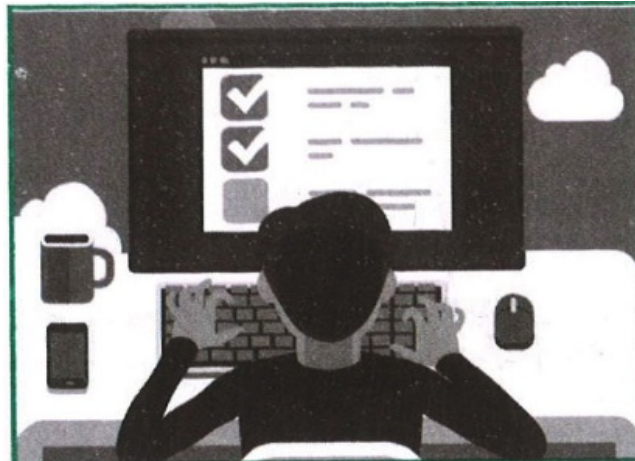   (iii) AP bisects ∠A as well as ∠D.

35. The perimeter of triangular field is 144 m. and its sides are in the ratio 3:4:5. Find the length of perpendicular from the opposite vertex to the side whose length is 60 m.

SECTION -E (Case study questions of 4 marks each)

Q.36. Read the following and answer the questions given below:

Education during Covid-19 has moved towards e-learning.

Ms. Ambika, a Class IX Maths teacher conducts an online MCQ test at the end of every chapter with pre-scheduled dates. This helps her to check the performance of students instantly and to know the area of improvement in a specific chapter. Take a look at the following questions she designed for her students and answer them.

(i) Write a rational and an irrational number between 5 and 6.

(ii) We know that $\frac{2}{7} = 0.285714$, than what is the value of $\frac{4}{7}$?

What is the $\frac{p}{q}$ form of the number 15.237, Where p and q are integers and q#0

(iii) Name different kind of decimal expansions. Give one example of each.

Q 37. Read the following and answer the questions given below:

Sushmit is a delivery boy. He rides Scotty on all working days. The distance covered on Scotty is given by the polynomial expression p=(x) = $x^2 + 3x - 10$. Assuming that he rides at the uniform speed and takes the time given by g (x) $= x - 2, x > 2$.

Use the information stated above and answer the questions given below:

(i) What is the speed of the scotty?

(ii) Find the sum of the degrees of the polynomial p=(x) and g(x).

(iii) If p(x) is replaced by $r(x) = 5x^2 - kx - 18$ and g(x) is a factor of r(x), then what will be the value of k?

OR

If p(x) is replaced by $4x^2 + 4x - 3$, then what are the possible expressions for time and speed.

Q.38. Read the following and answer the questions given below:

Look at the maps in Picture I and Picture II showing some places of an area of a city.
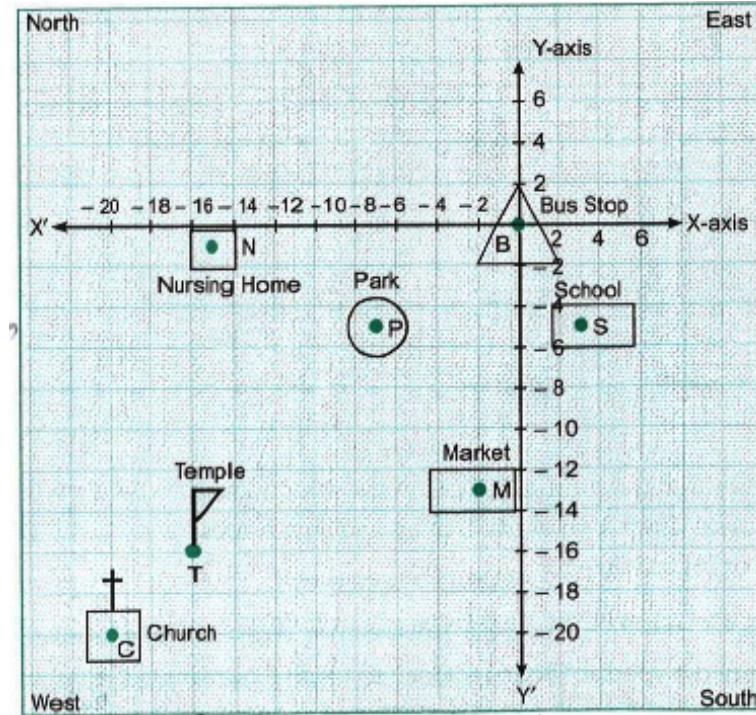
In Picture II, the map is put on coordinate axes by fixing the church (c) as the origin. IN Picture-III, the map is put on coordinate axes by fixing the Bus Stop (B) as the origin

(i)   What are the coordinates of Bus Stop (B) and Market (M) in Picture I?

(ii)   What is the perpendicular distance of Temple (T) from X-axis in Picture-II?

(iii)   In Picture I, the position of the Park is represented by the point

        (3a - 2, $\frac{7}{5}$ b +8), then what are the values of a and b?

OR

In Picture II, in which quadrant does the School (S) lie? Also, write the coordinates of the School (S).