SPECTRA PRACTICE PAPER (2025-2026)
CLASS-IXth
SUBJECT: MATHEMATICS

DURATION: 3 HRS. **M MARKS:80**

General Instruction:

1. This Question Paper has 5 Sections A-E.
2. **Section A** has 20 MCQs carrying 1 mark each.
3. **Section B** has 5 questions carrying 02 marks each.
4. **Section C** has 6 questions carrying 03 marks each.
5. **Section D** has 4 questions carrying 05 marks each.
6. **Section E** has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs 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
8. Draw neat figures wherever required. Take π=22/7 wherever required if not stated.

Section – A

This section consists of 20 questions each of 1 mark each :

1. If $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $y = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, then $x^2 + xy + y^2$ =
(a) 101 (b) 99 (C) 98 (d) 102

2. Factors of $(a+b)^3 - (a-b)^3$ are :
(a) ab, $3a^2 + b^2$ (b) $(3a^2 + b^2)$, 2a
(b) 2b, $(3a^2 + b^2)$ (d) $(3a^2 + b^2)$, 2ab

3. If the points P(0,-2) , Q (0,4) and R (a-5, 6) are lie on Y-axis , then the value of a is :
(a) (-3,2) (b) (-3,8) (C) (-3,-8) (d) (3,8)

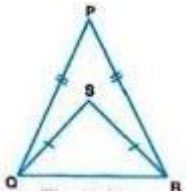
4. The perpendicular distance of the point p (-4,-3) form X -axis is
(a) -4 units (b) -3 units (c) 4 units (d) 3 units

5. The solution of linear equation 3x+0y -6 = 0 is :
(a) (-2,k) (b) (2,k) (c) (k,2) (d) (k,-2)

6. The things which are double of same thing are:
(a) Equal to one another
(b) Unequal
(c) Halves of same thing
(d) Doubles of the same thing

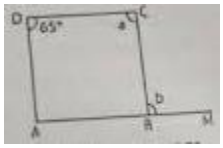
7. If the supplement of an angle is 4 times of its complement, find the angle.
(a) 60^0 (b) 50^0 (c) 80^0 (d) 100^0

8. In the given figure, the ratio of <PQS : <PRS is :



(a) 1:1 (b) 1:2 (c) 2:1 (d) 1:3

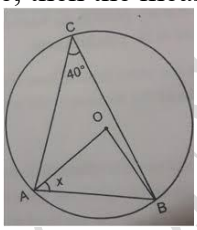
9. In ABCD is a parallelogram in which <ADC = 65^0 and AB is produced to point M as shown in the figure . Then a+b is :



(a) 235^0 (b) 230^0 (c) 225^0 (d) 0^0

10. Diagonals of quadrilateral ABCD , taken in order are in the ratio 3: 7: 6:4, then ABCD is a :
(a) Rhombus (b) Parallelogram (c) Trapezium (d) Kite

11. In the figure , if O is the centre of the circle, then the measure of x is :



(a) 40^0 (b) 50^0 (c) 80^0 (d) 110^0

12. The sides of a triangle are 8 cm, 11cm and 13 cm. What is its area?
(a) $8\sqrt{30}$ cm^2 (b) $4\sqrt{10}$ cm^2 (c) $3\sqrt{100}$ cm^2 (d) $6\sqrt{200}$ cm^2

13. The ratio of height and the diameter of a right circular cone is 3:2 and its volume is 1078 cm^3 . Then , its height is : (take $\pi = \frac{22}{7}$)
(a) 1254 cm^2 (b) 704 cm^2 (c) 550 cm^2 (d) 154 cm^2

14. A frequency polygon is constructed by plotting frequency of the class interval and the:
(a) Upper limit of the class (b) lower limit of the class
(c) mid- value of the class (d) any values of the class

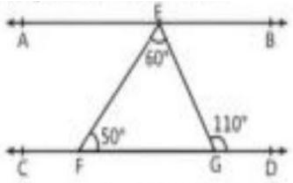
15. A rational number between 5 and 9 is :
(a) 8 (b) 7 (c) 7.2 (d) 7.5

16. If an equilateral triangle PQR is inscribed in a circle with centre O, then <QOR is equal to :
(a) 70^0 (b) 60^0 (c) 90^0 (d) 120^0

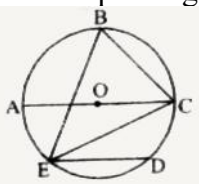
(a) Assertion (A) : Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A) .
(b) Assertion (A) : Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A) .
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true.

17. Assertion (A) : The degree of the polynomial (x-2) (x-3) (x+4) is 4.
Reason (R) : The number of zeroes of a polynomial is the degree of that polynomial .

18. Assertion (A) : In the adjoining figure, if AB‖CD, then <EGF = 70^0 .



Reason (R) : The linear pair of angles is supplementary.
19. Assertion (A) : Chord ED is parallel to the diameter AC of the circle. If <CBE = 60^0 , then <ACE is 30^0.
Reason (R) : Same segment of a circle do not make equal angles at the circumference.



20. Assertion (A) : If the volumes of two spheres in the ratio 125 : 8 , then their surface area are in the ratio 25 : 4.
Reason (R) : If R is the radius of a sphere, then volume and surface area of sphere are $\frac{4}{3}\pi$ R^3 cubic units and 4π R^2 sq.units.

Section – B

This section consists of 5 questions each of 2 marks each :

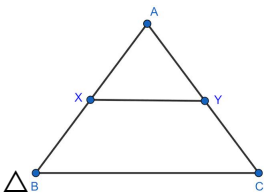
21. Factorise : $25x^2 + 9y^2 + 9z^2 - 30xy - 18yz + 30zy$

Or

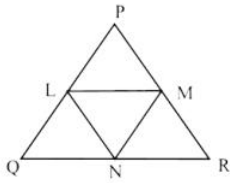
21 . If $x+\frac{1}{x} = 6$, then find the value of $x^3 + \frac{1}{x^3}$.

22. If we plot the points P(5,0) , Q(5,5) , R(-5,5) and S (-5,0), which figure will we get: Name the axis of symmetry of this figure?

23. In given figure AX = AY, AB = AC show that BX = CY



24. In the given figure L, M and N are mid point of the sides PQ, PR and QR respectively of △PQR. If PQ = 4.4 cm, QR = 5.6 cm and PR = 4.8 cm then find the perimeter of △LMN.



25. A cone and a hemisphere have equal base and equal volumes. Find the ratio of their heights.

Section – C

This section consists of 6 questions each of 3 marks each :

26. Simplify : $\frac{5^{36}+5^{35}+5^{34}}{5^{32}+5^{31}+5^{30}} + \frac{3^{40}+3^{39}+3^{38}}{3^{41}+3^{40}+3^{39}}$

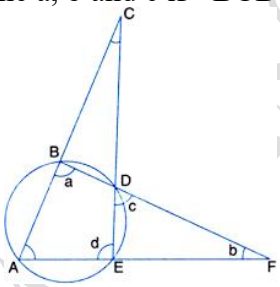
27. If x = 0 and x = -1 are the zeros of the polynomial $f(x) = 2x^3 - 3x^2 + ax + b$, find the value of a and b.

28. $F = \frac{9}{5}C + 32$, where F is temperature Fahrenheit and C is temperature in Celsius.
(i) If the temperature is 35^0 C , what is the temperature in Fahrenheit?
(ii) If the temperature is 30^0 C , what is the temperature in Fahrenheit?

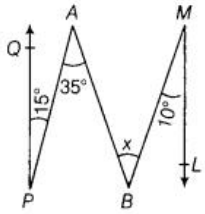
Or

28 . Show that the points A (1,-1) , B(2,6) and C(0,-8) lie on the graph of the linear equation 7x-y = 8.

29. In the given figure, determine a, b and c if <BCD = 43^0 and <BAF = 62^0 .



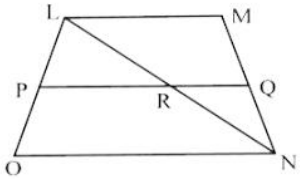
30. The cost of leveling a right angled triangular park is ₹ 2per km^2. The cost of leveling the whole part is ₹2700. If horizontal side of the park is 45 km long then find the length of longest side of the park.



31. In the given figure QP∥ML, find the value of x.

Section – D

This section consists of 4 questions each of 5 marks each :



32. In the given figure LMNO, is a trapezium in which LM is parallel to side ON and P is the mid point of side LO. If Q is a point on the side MN such that segment PQ is parallel to side ON .Prove that Q is the mid point of MN and PQ = $\frac{1}{2}$(LM +ON) .

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33. Show that $a = \frac{\sqrt{7}-\sqrt{6}}{\sqrt{7}+\sqrt{6}}$ and $b = \frac{\sqrt{7}+\sqrt{6}}{\sqrt{7}-\sqrt{6}}$, then find the value of $a^2 + b^2 + ab$.

34. A right circular cone is 5.4 cm high and radius of its base is 2 cm. It is melted and recast into another right circular right circular cone with radius of base as 1.5 cm. Find the equal height of the new cone. Prove that both the cones have equal volume.

35. Given below is the data of students who participated in different activities.

Activity	Sports	Meditation	Yoga	Walking
No. of girls	25	32	17	27
No. of boys	35	18	22	25

Section – E

This section consists of 3 questions each of 4 marks each :

36. Nari Niketan is an organization to help in women and child having distress. Drishti donated some amount to this organization for betterment. The amount of donation is represented by the expression ₹$4x^2 + \frac{1}{4x^2}$. She also discussed her fiends about this organization . Some of her friends wanted to know the amount of donation, but she did not disclose this amount to anyone. Somehow her friend got to know that she gave amount having expression $(2x + \frac{1}{2x})$, whose value is ₹90.

On the basis of the given information, solve the following questions:

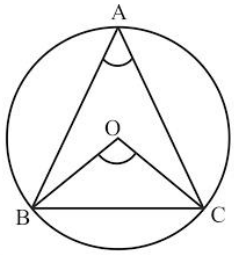
1. The amount donated by Drishti in the expression form is:
(a) linear equation (b) quadratic equation
(c) algebric expression (d) polynomial

2. If $x = \sqrt{2}$, then the amount donated by Drishti is :
(a) ₹ 8 (b) ₹ 8.125 (c) ₹ 8.75 (d) ₹ 9

3. The value of $(2x + \frac{1}{2x})^2$ is :
(a) 8000 (b) 8100 (c) 8200 (d) 8300

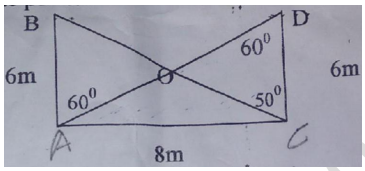
4. The amount donated by Drishti (in ₹) is :
(a) 9020 (b) 8098 (c) 8090 (d) 9000

37. Government of India is working regularly for the growth of handicapped persons. For this three STD booths situated at point P, Q and R are as shown in the figure, which are operated by handicapped persons. These three booths are equidistant from each other as shown in the figure.



On the basis of the above information , solve the following questions:
1. Which type of △PQR in the given figure?
2. Measure angle <QOR.
3. Find the value of <OQR.
4. Is it true that points P, Q and R lie on the circle?

38. Pragya is studying in class IX. She observe tow equal height of poles of length AB = CD = 6m. These poles are 8m apart from each other and O is the point of intersection of the lines joining the top of each pole to the foot of opposite poles.



On the basis of the above information , solve the following questions:
(i) In which congruent rule, △ABC ≅△CDA ?
(ii) Find the length of BC.

OR

What is the area of △ACD?
(iii) Prove that △ABO≅△DCO.