O. P. JINDAL SCHOOL, SAVITRI NAGAR

Annual Examination (2022 – 2023)

Class: IX **SAMPLE PAPER** **MM: 80**

Subject: Mathematics **Time: 3 Hrs.**

Fifteen Minutes Extra will be for reading the Question Paper.

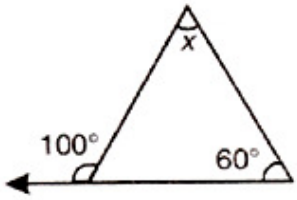
General Instructions:

1. This Question paper consists of five sections A, B, C, D and E. Each section is compulsory.
2. Section A has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.
3. Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.
4. Section C has 6 Short Answer (SA)-type questions of 3 marks each.
5. Section D has 4 Long Answer (LA)-type questions of 5 marks each.
6. Section E has 3 source based/case based/passage based questions of 4 marks each with sub parts.
7. There is no overall choices, however Internal choice is provided in **2** questions of Section –B, 3 questions of Section-C and 2 questions of Section-D. You have to attempt only one of the alternatives in all such questions.

SECTION –A

1. Which of the following is an irrational number?
   a) $\sqrt{16}$ b) $\sqrt{(12/3)}$ c) $\sqrt{12}$ d) $\sqrt{100}$
2. The product of a rational and an irrational numbers is:
   a) Always an integer b) Always a rational number
   c) Always an irrational number d) Sometimes rational and sometimes irrational
3. The decimal expansion of an irrational number may be:
   a) Terminating b) Either terminating or non- terminating
   c) Recurring d) Non-terminating and non-recurring
4. A binomial of degree 20 in the following is:
   a) $20x + 1$ b) $x/20 + 1$ c) $x^{20} + 1$ d) $x^2 + 20$
5. What is the degree of a zero polynomial?
   a) 0 b) 1 c) Any natural number d) Not defined
6. The value of the polynomial $8x^2 - 5x - 23$ at $x = -2$ is _____
   a) 19 b) -1 c) -19 d) 1
7. What is the distance of the point (4,5) from Y-axis?
   a) 3 b) 4 c) 5 d) none of these
8. If the points A(2, 0), B(-6, 0) and C(3, a – 3) lie on the x-axis, then the value of a is
   (a) 0 (b) 2 (c) 3 (d) -6
9. What is another name of Y-coordinate of a point.
   a) Abscissa b) Ordinate c) Coordinate d) Quadrant
10. Which of the following points does not lie on the line $3x - 4y = 10$.
    a) (2, -1) b) (-2, 1) c) (6 , 2) d) (-2 , -4)
11. The line drawn from the center of the circle to any point on its circumference is called:
    a) Radius b) Diameter c) Sector d) Arc
12. Two angles whose sum is equal to 180° are called:
    a) Vertically opposite angles b) Complementary angles
    c) Adjacent angles d) Supplementary angles
13. The consecutive angles of a parallelogram are
    a) Complementary b) Supplementary
    b) Equal d) None of these

14. Value of x in the figure below is:



a) 20^o b) 40^o c) 80^o d) 160^o

15. Which of the following is not a parallelogram?
a) Rhombus b) trapezium c) square d) rectangle

16. The angle subtended by the diameter of a semi-circle is:
a) 90^o b) 45^o c) 180^o d) 60^o

17. The surface area of a sphere of radius 14 cm is:
a) 1386 sq.cm b) 1400 sq.cm c) 2464 sq.cm d) 2000 sq.cm

18. The median of the data: 155 160 145 149 150 147 152 144 148 is
a) 149 b) 150 c) 147 d) 144

ASSERTION-REASON BASED QUESTIONS

In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

19. Assertion (A) : The equation $2x - 9 = 0$ represents a line Parallel to x-axis
Reason (R) : The equation of a line parallel to x – axis is x = a
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false.
(d) A is false but R is true.

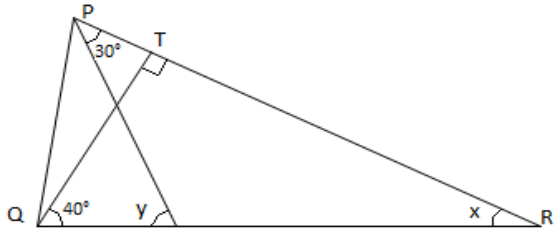
20. Assertion (A) : If $y^{97} + 97$ is divided by y + 1, the remainder is 0
Reason (R) : If a polynomial p(x) is divided by linear polynomial x – a, then the remainder is p(a).
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is NOT the correct explanation of A.
(c) A is true but R is false
(d) A is false but R is true

SECTION –B

21. Evaluate $(105)^3$ using suitable identity

22. Write two equations of straight lines passing through the point (2 , 3)

23. In the given figure, QT⊥PR, ∠TQR= 40° and ∠SPR= 30°. Find x and y.



24. If the area of an equilateral triangle is $36\sqrt{3}$ cm^2. Find the side.

OR

Sides of a triangle are in the ratio of 5: 12: 13 and its perimeter is 540 cm. Find its area.

25. Find the surface area of a sphere of radius 14 cm.

OR

Find the curved surface area of a cylinder of height 15 cm and circumference of base as 44cm.

SECTION –C

26. Represent $\sqrt{3}$ on a number line.

OR

Find the values of a and b if $\frac{\sqrt{5}+2}{\sqrt{5}-2} = a+b\sqrt{5}$

27. Verify that

$x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x + y+z)[(x-y)^2 + (y - z)^2 + (z - x)^2]$

28. In a hot water heating system, there is a cylindrical pipe of length 28 m and diameter 5 cm. Find the total radiating surface in the system.

OR

The diameter of the Moon is approximately one-fourth of the diameter of the Earth. Find the ratio of their surface areas.

29. Construct a triangle PQR in which PQ + QR + PR = 11 cm, $Q = 60^0$ and $R = 45^0$.

30. Thirty children were asked about the number of hours they watched TV programmes in the previous week. The results were found as follows

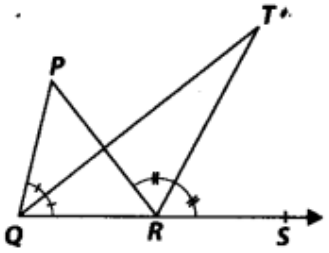
1	6	2	3	5	12	5	8	4	8
10	3	4	12	2	8	15	1	17	6
3	2	8	5	9	6	8	7	14	12

(i) Make a grouped frequency distribution table for this data, taking class width 5 and one of the class intervals as 5 – 10.

(ii) How many children watched television for 15 or more hours a week?

31. In figure, the side QR of ΔPQR is produced to a point S. If the bisectors of ∠PQR and ∠PRS meet at point T, then prove that

$\angle QTR = \frac{1}{2}\angle QPR.$

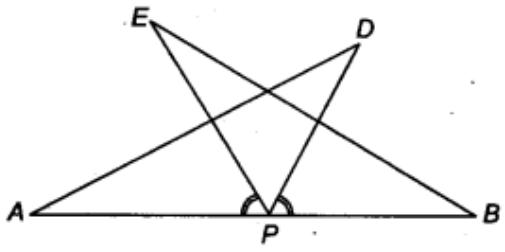


OR

AS is a line segment and P is its mid-point. D and E are points on the same side of AB such that ∠ BAD = ∠ ABE and ∠ EPA = ∠ DPB. (see figure). Show that

(i) ΔDAP ≅ ΔEBP

(ii) AD = BE



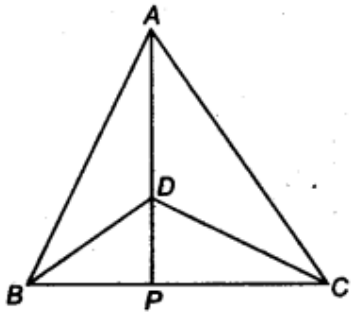
SECTION –D

32. If two circles intersect at two points, prove that their centres lie on the perpendicular bisector of the common chord.

OR

Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their centres is 4 cm. Find the

33. 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 figure). If AD is extended to intersect BC at P, show that

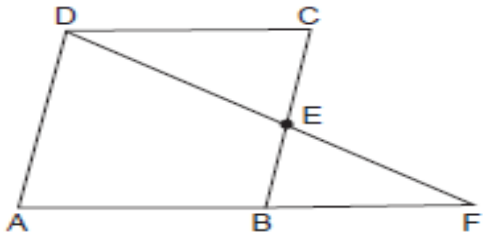


(i) ΔABD ≅ ΔACD
(ii) ΔABP ≅ ΔACP
(iii) AP bisects ∠A as well as ∠D
(iv) AP is the perpendicular bisector of BC

34. Show that diagonals of a rectangle are equal.

OR

ABCD is a parallelogram and E is the mid-point of side BC. DE and AB on producing meet at F. Prove that AF = 2AB.



35. The following table gives the lifetimes of 400 neon lamps

Life time (in hours)	**Number of lamps**
300 - 400	14
400 - 500	56
500 - 600	60
600 - 700	86
700 - 800	74
800 - 900	62
900 -1000	48

(i) Represent the given information with the help of a histogram.

(ii) How many lamps have a lifetime of more than 700 hours?

SECTION - E

Read the passage given below and answer the questions:

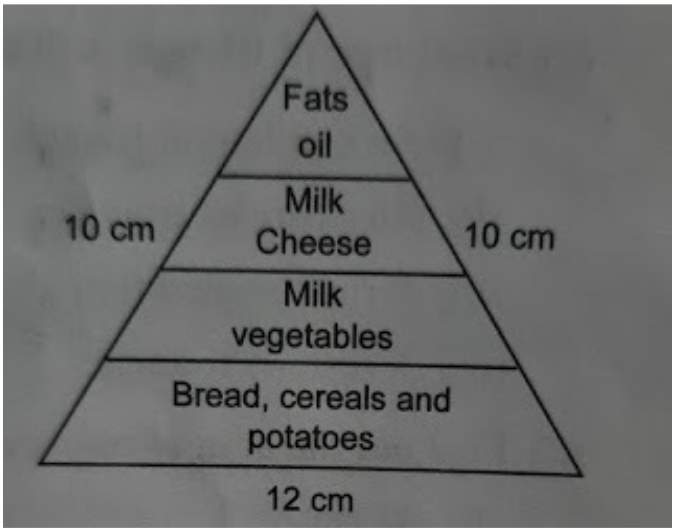
36. Once four friends Rahul, Arun, Ajay and Vijay went for a picnic at a hill station. Due to peak season, they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent at a park. So they purchased canvas cloth at the rate of Rs 4 per m^2 and made a tent with height 6 m and diameter 16 m as shown in figure.

(i) What is the slant height of the tent?
(ii) How much Cloth is used for making tent?
(iii) What is the volume of air in the tent?
(iv) What is the total cost of canvas cloth required to make the tent?

37. Aditi runs a handicraft shop in Bapu bazar in Jaipur. She makes beautiful necklaces using colourful beads which she keeps in a potli. Today she prepared 19 necklaces but could not make the 20th necklace as she had no yellow beads left. She counted the beads and found that there were 8 red, 6 green and 14 blue beads remaining in her potli. Her little daughter Dulari requested for a bead. Aditi decides to take out one bead from her potli for Dulari.

(i) Find the probability that she draws a green bead.
(ii) Find the probability that the bead drawn by her is not green.
(iii) Find the probability that she draws either a green or a blue bead.
(iv) Find the probability that she draws neither a red nor a green bead.

38. A food pyramid is a representation of the optimal number of servings to be eaten each day from each of basic food groups. It is designed to make healthy eating easier. Health care NGO in India working for underprivileged children. In rural areas health statistics are continue to poor. In this direction Health statistics are continue to poor. In this direction Health Care India has made the children under the age of 13 aware of "food pyramid" by telling the importance of different food groups such as carbohydrates, fats, vitamins, proteins, minerals etc. The models of food pyramid which they have used triangle with sides 10 cm, 10 cm, 12 cm.



(i) Which type of triangle is given in food pyramid ?
(ii) What is the semi perimeter of the triangle?
(iii) Find the area of food pyramid which is in shape of triangle
(iv) The pyramid was not coloured. It got painted at rate of Rs 20 per m^2. What was the total cost of painting?

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