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PAPER 9
CLASS 9

General Instructions:

1. This question paper contains five sections – A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
2. Section A has 18 questions and 2 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/ integrated units of assessment (4 marks each) with sub – parts.

Section – A

Section A consists of 20 questions of 1 mark each.

1. Which of the following is a rational number?

a. π b. 0 c. $2\sqrt{3}$ d. $1+\sqrt{5}$

2. If $x = 2+\sqrt{3}$, then $\frac{1}{x}$ =?
3. Find the value of $[4-5(4-5)^4]^3$.
4. If $x=-1$ is a zero of $x^3-2x^2+3ax+5$, then the value of a =?
5. When $p(x)=x^3-6x^2+2x-4$ is divided by $x-2$, then the remainder is ____.
6. If $x+2$ is a factor of $x^2-kx+14$, then the value of k is ____.
7. The abscissa of a point is the distance of the point from ____.
8. Point $(a,0)$ lies on which axis?
9. The angle formed between the coordinate axis is ___.
10. A linear equation in two variables has maximum ____ solutions.
11. At what point, the graph of $3x+2y=9$ cuts the $y-axis$?
12. What is the distance of the point $(3,-7)$ from $x-axis$?
13. What is the distance of the point $(-5,-7)$ from $y-axis$?
14. If an angle is equal to its complement, then the angle is ____.

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15. Find the reflex angle of $179°$.
16. The sides of a triangle are 3 cm, 4 cm and 5 cm. Find the area of the triangle.
17. The perimeter of an equilateral triangle is 60 m. Find its area.
18. The class mark of the class interval 4.7 – 6.3 is ____.

Directions: In question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R).
Choose the correct option.

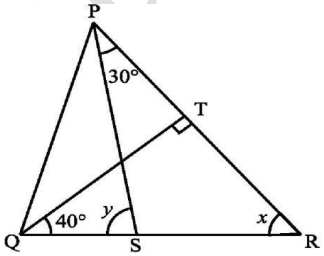
a. Both assertion (A) and reason (R) are true, and reason (R) is the correct explanation of assertion (A).
b. Both assertion (A) and reason (R) are true, and reason (R) is not the correct explanation of assertion (A).
c. Assertion (A) is true, but reason (R) is false.
d. Assertion (A) is false, but reason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

19. Assertion (A): The point $(0, -3)$ lies on $y - axis$.
Reason (R): The $x -$ coordinate of the point on $y - axis$ is zero.
20. Assertion (A): The polynomial $9x^2 - 18x + 9$ has two zeroes.
Reason (R): Quadratic polynomial has at most two zeroes.

Section – B

This section comprises of very short answer type questions (VSA) of 2 marks each.

21. The class marks of a distribution are 25, 35, 45, 55, 65. Determine the class size and the class limits.
22. The volume of a sphere is 310.4 cm^3. Find its radius.
23. If the perimeter of a triangle is x cm and its sides are p, q and r cm, what will be the area of this triangle? Use Heron's formula.
24. (i) In the given figure, if QT ⊥ PR, $\angle TQR = 40°$ and $\angle SPR = 30°$, find the value of x and y.



OR

In the given figure, if AB || CD, $\angle APQ = 50°$ and $\angle PRD = 127°$, find the value of x and y.

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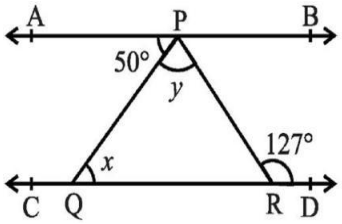


25. A die is thrown 400 times, the frequency of the outcomes of the events are given as under:

Outcome	1	2	3	4	5	6
Frequency	70	65	60	75	63	67

find the probability of occurrence of an odd number.

Section – C

This section comprises of short answer type questions (SA) of 3 marks each.

26. A school provides milk to the students daily in a cylindrical glass of diameter 7 cm. If the glass is filled with milk up to a height of 12 cm, find how many litres of milk is needed to serve 1600 students?

OR

Johny wants to stitch a cover for his CPU whose length, breadth and height are 20 cm, 45 cm and 50 cm respectively. Find the amount he has to pay if its costs ₹ 50 per sq. m.

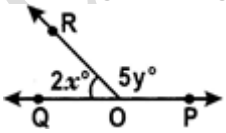
27. If $\frac{3+2\sqrt{5}}{3-2\sqrt{5}} = p + q\sqrt{5}$, then find the value of $11(p+q)$.

28. Find the value of $p(1) + p(-1) + p(10)$ if $p(x) = x^2 - 3x + 2$.

29. Plot the points $A(-4, 4), B(-8, -1), C(5, -1)$ and $D(1, 4)$ on a graph. What type of quadrilateral is ABCD? Find its area and perimeter.

30. Prove that if a transversal intersects two parallel lines, then each pair of interior angles on the same side of the transversal is supplementary.

31. In the given figure, find the value of y, when $x = 30°$.



OR

Find the value of a and b, if $a - b = 40°$.

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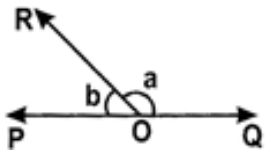

Section – D

This section comprises of long answer type questions (LA) of 5 marks each.

32. Show that $\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}} - \frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}} - \frac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}} = 1.$

OR

Simplify: $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \frac{1}{\sqrt{4}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{8}} + \frac{1}{\sqrt{8}+\sqrt{9}}$

33. Evaluate:

a. 99^2

b. 999^3

c. If $x + y = 10$ and $xy = 50$, then find the value of $x^2 + y^2$.

d. If $x + y = 5$ and $xy = 6$, then find the value of $x^3 + y^3$.

e. Find the value of $(25)^2 - (20)^2$.

34. Ajay prepared a dish and kept it in a hemispherical bowl of 30 cm diameter. He distributed the dish in cylindrical cups of diameter 15 cm and height 4 cm among his friends and himself. How many friends were there with Ajay?

OR

Three spheres of radii 3 cm, 4 cm and 5 cm are melted to form a new sphere. Find the radius of the new sphere.

35. Sarika distributes chocolates on Children's Day. She gives 5 chocolates to each child and 20 chocolates to adults. If the number of children is represented by x and the total distributed chocolates as y:

a. Write it in the form of linear equation in two variables.

b. If she distributed 145 chocolates in total, find the number of children?

Section – E

This section comprises of 3 case study/ passage based questions of 4 marks each.

36. During summer vacations, Rohit was getting bored due to lockdown in this city. Because of the COVID pandemic, he could not go out to play with his friends. His mother suggested him to start making some origami craft

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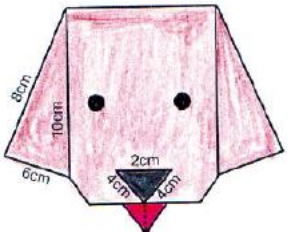
material. He learnt origami craft through internet and made a puppy as shown in the figure.



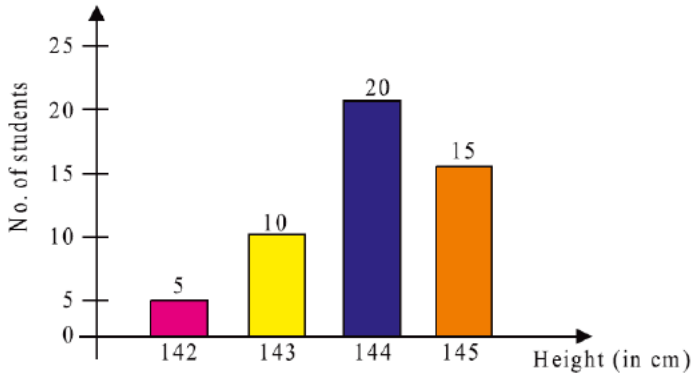
Based on the above information and measurement of different parts of the figure, answer the following questions:

a. What is the area of one of the ears of the puppy? (Both ears are similar)
b. What is the area of the paper used to make the nose of the puppy?
c. If the tongue of the puppy is in the shape of an equilateral triangle, with side 2 cm each, then what is the area of the paper used to make the tongue? What will be the length of the middle line of the tongue as shown in the figure?

OR

If the total area of the paper used to make the puppy is 96 cm^2, then find the area of the paper used to make the face (except the ears, nose and tongue) of the puppy?

37. The following bar graph represents the heights (in cm) of 50 students of class IX of a particular school.



a. What is the percentage of the total students whose height is more than 142 cm?
b. How many students in the class have maximum height?
c. How many students have their height between 142 cm and 145 cm?

OR

What is the range of the data?

38. Kaushal a 9^{th} class student loves chocolate. On his birthday his mother gifts him a chocolate baking tray. The tray has 6 hemispherical cavities each of

diameter 8.4 cm. Kaushal prepares the chocolates on his birthday using this tray and share the hemispherical chocolates with his friends.

Based on above information, answer the following questions:

a. Find the radius of the hemispherical chocolate.
b. Find the volume of each hemispherical chocolate.
c. Kaushal wants to cover each chocolate with paper. How much paper will be required for the whole tray of chocolates?

OR

If Neha eats two third of the chocolates (assuming the tray is full of chocolate). How much volume of chocolates does she eat?

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