

CLASS IX (2019-20)
MATHEMATICS (041)
SAMPLE PAPER-04

Time : 3 Hours

Maximum Marks : 80

General Instructions :

- (i) All questions are compulsory.
- (ii) The questions paper consists of 40 questions divided into four 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 choices have 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.

- Q1. Rational number between $\sqrt{2}$ and $\sqrt{3}$ is [1]
 (a) $\frac{\sqrt{2} + \sqrt{3}}{2}$ (b) $\frac{\sqrt{2} \times \sqrt{3}}{2}$
 (c) 1.5 (d) 1.8
- Q2. If $8x^4 - 8x^2 + 7$ is divided by $2x + 1$, the remainder is [1]
 (a) $\frac{11}{2}$ (b) $\frac{13}{2}$
 (c) $\frac{15}{2}$ (d) $\frac{17}{2}$
- Q3. Point $(0, 3)$ lies [1]
 (a) on x -axis (b) on y -axis
 (c) in I quadrant (d) at origin
- Q4. The value of k , if $x = 2, y = -1$ is a solution of the equation $2x + 3y = k$ is [1]
 (a) 6 (b) 7
 (c) 5 (d) 1
- Q5. Which of the following needs a proof? [1]
 (a) Postulates (b) Definition
 (c) Proposition (d) Axiom
- Q6. The value of x if AOB is a straight line, is [1]
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- (a) 36° (b) 60°
 (c) 30° (d) 35°
- Q7. Which of the following is a correct statement? [1]
 (a) Two triangles having same shape are congruent.
 (b) If two sides of a triangle are equal to the corresponding sides of another triangle, then the two triangles are congruent.

- (c) If the hypotenuse and one side of one right triangle are equal to the hypotenuse and one side of the other triangle, then the triangles are not congruent.
- (d) None of these

- Q8. Which of the following statements is true? [1]
- (a) In a parallelogram, the diagonals are equal
- (b) In a parallelogram, the diagonals bisect each other.
- (c) In a parallelogram, the diagonals intersect each other at right angles.
- (d) In any quadrilateral, if a pair of opposite sides are equal, it is parallelogram.
- Q9. The area of a rhombus if the lengths of whose diagonals are 16 cm and 24 cm, is [1]
- (a) 180 cm² (b) 184 cm²
- (c) 198 cm² (d) 192 cm²
- Q10. In a cyclic quadrilateral, the difference between two opposite angles is 58°, the measures of opposite angles are [1]
- (a) 158°, 22° (b) 129°, 51°
- (c) 109°, 71° (d) 119°, 61°

(Q.11-Q.15) Fill in the blanks :

- Q11. The construction of a triangle ABC , given that $BC = 6$ cm, $\angle B = 45^\circ$ is not possible when difference of AB and AC is equal to cm. [1]
- Q12. The percentage increase in the area of a triangle, if its each side is quadrupled, is equal to percentage. [1]

OR

If length of hypotenuse of an isosceles right angled triangle is $10\sqrt{2}$ cm then its perimeter will be

- Q13. The curved surface area of a right circular cone whose slant height is 10 cm and base radius is 7 cm is [1]
- Q14. can also be drawn independently without drawing a histogram. [1]
- Q15. A is an action which results in one of several outcomes. [1]

(Q.16-Q.20) Answer the following :

- Q16. If the volume of a cuboid is $2x^2 - 16$, then find its possible dimensions. [1]
- Q17. On which axes do the points (3, 0) and (0, 4) lie? [1]
- Q18. In the given figure, $AB \parallel CD$, $\angle EAB = 50^\circ$. If $\angle ECD = 60^\circ$ [1]
- Q19. The area of the base of a right circular cylinder is 154 cm² and its height is 15 cm. Find the volume of the cylinder. [1]
- Q20. The class marks of a frequency distribution are 15, 20, 25, Find the class corresponding to the class mark 20. [1]

OR

If mean of 3, 5, 7, 9, x , is 5 then find the value of x .

SECTION B

- Q21. If $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$, then find the values of a and b . [2]

OR

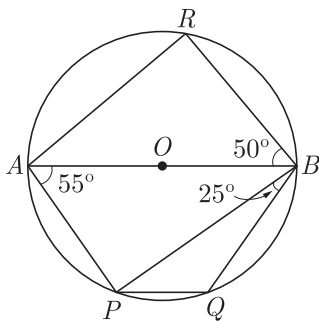
Simplify : $\frac{7+\sqrt{3}}{7-\sqrt{3}} + \frac{7-\sqrt{3}}{7+\sqrt{3}}$

- Q22. Write the coordinates of a point on x -axis at a distance of 4 units from the origin in the positive direction of x -axis and then justify your answer. [2]
- Q23. A chord of a circle is equal to its radius. Find the angle subtended by this chord at a point in major segment. [2]
- Q24. The sides of a triangle are 11 cm, 60 cm and 61 cm. Find the altitude of the smallest side. [2]

OR

The length of the sides of a triangle are $5x$, $5x$ and $8x$. Find the area of triangle.

- Q25. In the adjoining figure, AB is a diameter of a circle with centre O . If $\angle PAB = 55^\circ$, $\angle PBQ = 25^\circ$ and $\angle ABR = 50^\circ$, then find $\angle PBA$ and $\angle BAR$. [2]



- Q26. Find a point on x -axis from where graph of linear equation $2x = 1 - 5y$ will pass. [2]

OR

If the points $(1, 0)$ and $(2, 1)$ lie on the graph of $\frac{x}{a} + \frac{y}{b} = 1$, then find the values of a and b .

SECTION C

- Q27. Draw the graph of linear equation $x + 2y = 8$. From the graph, check whether $(-1, -2)$ is a solution of this equation. [3]

OR

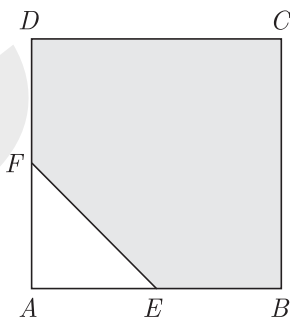
Solve : $\frac{5}{x} + 6y = 13$, $\frac{3}{x} + 4y = 7$.

- Q28. A teak wood log is cut first in the form of a cuboid of length 2.3 m, width 0.75 m and of a certain thickness. Its volume is 1.104 m^3 . How many rectangular planks of size $2.3 \text{ m} \times 0.75 \text{ m} \times 0.04 \text{ m}$ can be cut from the cuboid ? [3]

OR

A cylindrical roller 2.5 m in length, 1.5 m in radius when rolled on a road was found to cover the area of 16500 m^2 . How many revolutions does it make ?

- Q29. In the given figure, $ABCD$ is a square of side 4 cm. E and F are the mid points of AB and AD respectively. Find the area of the shaded region. [3]



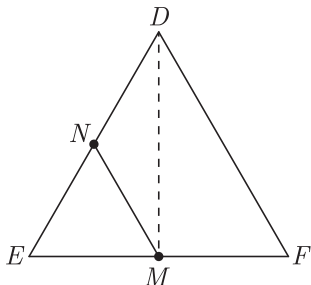
- Q30. Find the median of descending order 34, 32, x , $x - 1$, 19, 15, 11 where x is the mean of 10, 20, 30, 40, 50. [3]

OR

A bag contains 12 balls out of which x balls are white. If one ball is taken out from the bag, find the probability of getting a white ball. If 6 more white balls are added to the bag and the probability now for getting a white ball is double the previous one, find the value of x .

Q31. Draw line l and m intersected by a transversal t . Construct angle bisectors of the interior angle on same side of the transversal. [3]

Q32. In $\triangle DEF$, M and N are mid-points of sides EF and DE respectively. If $ar(\triangle ENM) = 4 \text{ cm}^2$, find $ar(\triangle DEF)$. [3]



Q33. Prove that the circle drawn on any of the equal sides of an isosceles triangle as diameter bisects the base. [3]

Q34. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 3 : 2, then find the greater of the two angles. [3]

SECTION D

Q35. If $x = (2 + \sqrt{5})^{1/2} + (2 - \sqrt{5})^{1/2}$ and $y = (2 + \sqrt{5})^{1/2} - (2 - \sqrt{5})^{1/2}$ evaluate $x^2 + y^2$. [4]

OR

If $a = \frac{1}{7 - 4\sqrt{3}}$ and $b = \frac{1}{7 + 4\sqrt{3}}$, find the values of the following :

(i) $a^2 + b^2$

(ii) $a^3 + b^3$

Q36. Simplify : $\left[\frac{(4x^2 - 9y^2)^3 + (9y^2 - 16z^2)^3 + (16z^2 - 4x^2)^3}{(2x - 3y)^3 + (3y - 4z)^3 + (4z - 2x)^3} \right]$. [4]

Q37. The linear equation that converts Fahrenheit (F) to Celsius (C) is given by the relation $C = \frac{5F - 160}{9}$ [4]

- (i) If the temperature is 86°F , what is the temperature in Celsius ?
- (ii) If the temperature is 35°C , what is the temperature in Fahrenheit ?
- (iii) If the temperature is 0°F , what is the temperature in Celsius ?
- (iv) What is the numerical value of the temperature which is same in both the scales ?

Q38. In $\triangle ABC$, if AD is the median, then prove that $AB^2 + AC^2 = 2AD^2 + \frac{1}{2}BC^2$. [4]

Q39. A random survey of the number of children of various age groups playing football match in a park was found as follows [4]

Age (in years)	Number of children
1-2	5
2-3	4
3-5	10
5-7	12
7-10	9
10-15	10
15-17	8

Draw a histogram to represent the above data.

OR

If the mean of the following frequency distribution is 28.25, find the value of p .

x_i	15	20	25	30	35	40
f_i	8	7	p	14	15	6

- Q40. While selling clothes for making flags, a shopkeeper claims to sell each piece of cloth in the shape of an equilateral triangle of each side 10 cm while actually he was selling the same in the shape of an isosceles triangle with sides 10 cm, 10 cm and 8 cm. How much cloth was he saving in selling each flag ? [4]