

**CLASS IX (2019-20)**  
**MATHEMATICS (041)**  
**SAMPLE PAPER-06**

**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.

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**SECTION A**

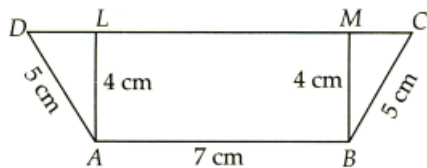
**Q.1-Q.10 are multiple choice questions. Select the most appropriate answer from the given options.**

- Q1. The rational number between  $1/2$  and  $1/3$  is [1]  
(a)  $2/5$  (b)  $1/5$   
(c)  $3/5$  (d)  $4/5$
- Q2. Which of the following algebraic expressions is not a polynomial ? [1]  
(a)  $\frac{17}{2}x^2 + x - 3$  (b)  $\sqrt{7}x^3 + 3x^{2/3} - 8$   
(c) 3 (d) 0
- Q3. Point  $(-2, 3)$  lies in the [1]  
(a) first quadrant (b) second quadrant  
(c) third quadrant (d) fourth quadrant
- Q4. The distance between  $M(-1, 5)$  and  $N(x, 5)$  is 8 units. The value of  $x$  is [1]  
(a)  $-9$  or  $9$  (b)  $-7$  or  $9$   
(c)  $-9$  or  $7$  (d)  $-7$  or  $-9$
- Q5. Euclid's Postulate 1 is [1]  
(a) A straight line may be drawn from any point to any other point.  
(b) A terminated line can be produced indefinitely.  
(c) All right angles are equal to one another.  
(d) None of these
- Q6. If the supplement of an angle is three times its complement, then angle is [1]  
(a)  $40^\circ$  (b)  $35^\circ$   
(c)  $50^\circ$  (d)  $45^\circ$
- Q7. In triangles  $ABC$  and  $5RQP$ , if  $AB = AC$ ,  $\angle C = \angle P$  and  $\angle B = \angle Q$ , then two triangles are [1]  
(a) isosceles but not necessarily congruent  
(b) isosceles and congruent  
(c) congruent but not isosceles  
(d) neither congruent nor isosceles

Q8. A quadrilateral having only one pair of opposite sides parallel is called a [1]

- (a) square (b) rhombus
- (c) trapezium (d) parallelogram

Q9. In figure,  $ABCD$  is a trapezium in which  $AB \parallel DC$ . Find the length of  $DC$ . [1]



- (a) 17 cm (b) 11 cm
- (c) 13 cm (d) 15 cm

Q10. In a cyclic quadrilateral  $ABCD$ , if two sides are parallel, which of the following statements is definitely false? [1]

- (a) Remaining two sides are equal
- (b) Diagonals are not equal
- (c) Diagonals intersect at the centre of circle
- (d) Both (a) and (c)

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

Q11. The construction of a  $\triangle LMN$  in which  $LM = 8$  cm,  $\angle L = 45^\circ$  is possible when  $(MN + LN)$  is ..... cm. [1]

Q12. The lengths of the three sides of a triangular field are 40 m, 24 m and 32 m respectively. The area of the triangle is .....  $m^2$ . [1]

Q13. Cube is a special form of ..... . [1]

Q14. The ..... of a class interval is called its class mark. [1]

Q15. Probability of an event can be any ..... from 0 to 1. [1]

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

Q16. Determine the degree of the polynomial :  $x^3(2 - x^3)$ . [1]

Q17. In the given figure, find the point identify the coordinate  $(-5, 3)$ . [1]

Q18. Solve the equation  $m - 25 = 40$  and state which axiom will use here? [1]

Q19. If the length of a median of an equilateral triangle is  $x$  cm, find its area. [1]

Q20. A boy says that the median of 4, 15, 19, 21 and 6 is 19. What does not the boy understand about finding the median? [1]

**SECTION B**

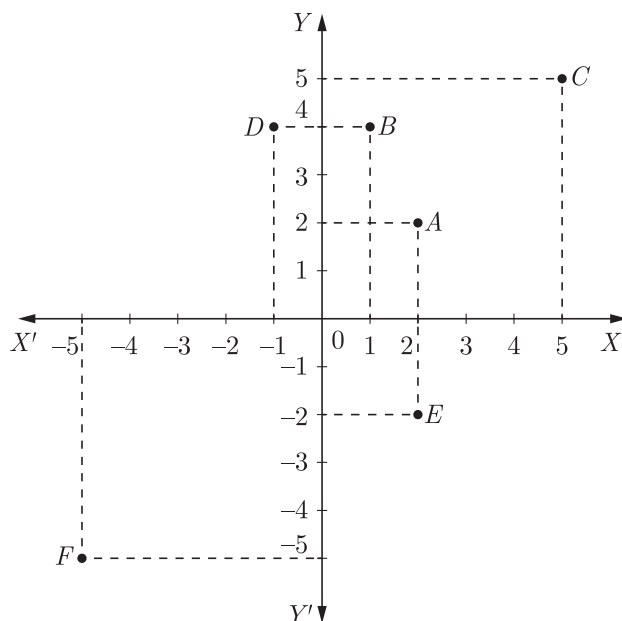
Q21. Simplify :  $\frac{1}{\sqrt{5} + \sqrt{3}} + \frac{1}{2}(\sqrt{5} - \sqrt{3})$  [2]

**OR**

If  $\sqrt{3} = 1.732$  and  $\sqrt{2} = 1.414$ , then find the value of  $\frac{1}{\sqrt{3} - \sqrt{2}}$ .

Q22. Write two solutions of the linear equation  $x + 2y = 1$ . [2]

- Q23. From the following figure, find the coordinates of the points  $A, B, C, D, E$  and  $F$ . Which of the points are mirror images in (i)  $x$ -axis, (ii)  $y$ -axis. [2]

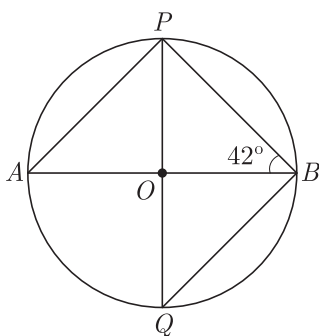


- Q24. In  $\triangle ABC$ , if  $\angle A = (2x - 5^\circ)$ ,  $\angle B = (5x + 5^\circ)$  and  $\angle C = (3x + 50^\circ)$ , then find the values of  $x$  and  $\angle C$ . [2]

OR

In  $\triangle ABC$ , if  $\angle A : \angle B : \angle C = \frac{1}{2} : \frac{1}{3} : \frac{1}{6}$ , then calculate the measures of  $\angle A, \angle B$  and  $\angle C$ .

- Q25. In the following figure, find the measure of  $\angle PQB$ , where  $O$  is the centre of the circle. [2]



- Q26. The height of a cylinder is 15 cm and the curved surface area is  $660 \text{ cm}^2$ . Find its radius. [2]

OR

The diameter of the moon is approximately one fourth of the diameter of the earth. Find the ratio of their surface areas.

### SECTION C

- Q27. If  $(x + 4)$  is a factor of the polynomial  $x^3 - x^2 - 14x + 24$ , find its other factors. [3]

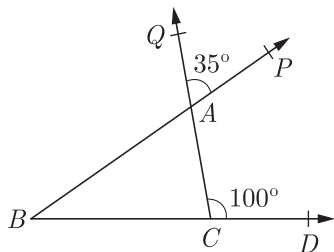
OR

Let  $R_1$  and  $R_2$  are the remainders when polynomial  $f(x) = 4x^3 + 3x^2 + 12ax - 5$  and  $g(x) = 2x^3 + ax^2 - 6x - 2$  are divided by  $(x - 1)$  and  $(x - 2)$  respectively. If  $3R_1 + R_2 - 28 = 0$ , find the value of  $a$ .

- Q28. If two parallel lines are intersected by a transversal, then prove that the bisectors of two alternate interior angles are parallel. [3]

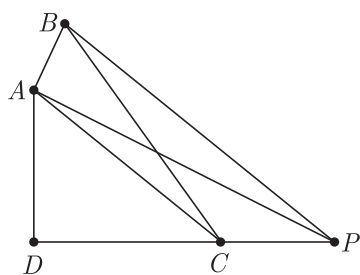
OR

Side  $BC, CA$  and  $BA$  of triangle  $ABC$  produced to  $D, Q, P$  respectively as shown in the figure. If  $\angle ACD = 100^\circ$  and  $\angle QAP = 35^\circ$ , find all the angles of a triangle.

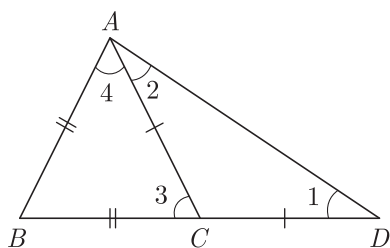


Q29. The diagonals of a quadrilateral  $ABCD$  are perpendicular, show that quadrilateral formed by joining the mid-points of its sides, is rectangle. [3]

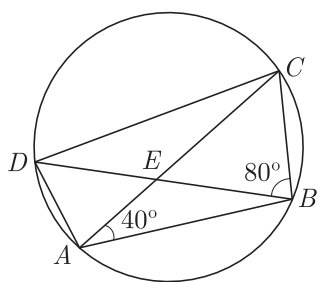
Q30. In the given figure,  $ABCD$  is a quadrilateral.  $BP$  is drawn parallel to  $AC$  and  $BP$  meets  $DC$  (produced) at  $P$ . Prove that  $ar(\triangle ADP) = ar$  (quadrilateral  $ABCD$ ). [3]



Q31. In the given figure,  $AB = BC$  and  $AC = CD$ . Prove that  $\angle BAD : \angle ADB = 3 : 1$ . [3]



Q32. In the given figure, if  $\angle DBC = 80^\circ$  and  $\angle BAC = 40^\circ$ , then find  $\angle BCD$ . Further, if  $AB = BC$ , then find  $\angle ECD$ . [3]



Q33. The length, breadth and height of a cuboid are 8 m, 6 m and 4 m respectively. Find its total surface area, diagonal and area of four walls. [3]

**OR**

A heap of wheat is in the form of a cone whose diameter is 10.5 m and height is 3 m. Find its volume. The heap is to be covered with canvas, find the area of the canvas required.

Q34. The probabilities of a student getting  $A, B, C$  and  $D$  grades are 0.35, 0.25, 0.35 and 0.05. Then, find the probability that a student gets atmost grade  $C$ . [3]

**SECTION D**

Q35. Find nine rational numbers between 0 and 0.1. [4]

- Q36. Factorise,  $2x^3 - 5x^2 - 19x + 42$ . [4]
- Q37. The parking charges of a car in a parking lot is ₹ 30 for the first two hours and ₹ 10 per hour for subsequent hours. Taking total parking time to be  $x$  hours and total charges as ₹  $y$ , write a linear equation in two variables to express the above statement. Draw a graph for the linear equation and read the charges for five hours. [4]
- Q38. Construct an angle of  $150^\circ$  of the initial point of a given ray and justify the construction. [4]

**OR**

Construct a right triangle whose base is 12 cm and sum of its hypotenuse and other side is 18 cm.

- Q39. What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6m ? Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm. (Take  $\pi = 3.14$ ) [4]
- Q40. Cards marked with the numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the probability that the number on the card is : [4]
- (i) an even number
  - (ii) a number less than 14
  - (iii) a number which is a perfect square.

**OR**

The average weight of all male stars in a multi-star Bollywood movie is 71.2 kg where as average weight of all female co-stars is 50.8 kg. If the mean weight of male and female stars acting in the movie is 60 kg. Find the ratio of number of male stars to the number of female co-stars acting in the movie.

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