

CLASS IX (2019-20)
MATHEMATICS (041)
SAMPLE PAPER-03

Time : 3 Hours

Maximum Marks : 80

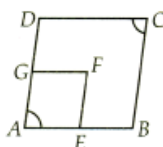
General Instructions :

- (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. The rationalising factor of $\sqrt[5]{a^2 b^3 c^4}$ is [1]
 (a) $\sqrt[5]{a^3 b^2 c}$ (b) $\sqrt[4]{a^3 b^2 c}$
 (c) $\sqrt[3]{a^3 b^2 c}$ (d) $\sqrt{a^3 b^2 c}$
- Q2. Factorisation of $a^{2x} - b^{2x}$ is [1]
 (a) $(a^x + b^x)(a^x - b^x)$ (b) $(a^x - b^x)^2$
 (c) $(a^x + b^x)(a^2 - b^2)$ (d) $(a^x - b^x)(a^2 + b^2)$
- Q3. In which quadrant will $(-3, 4)$ lie? [1]
 (a) I quadrant (b) II quadrant
 (c) III quadrant (d) IV quadrant
- Q4. The number of solutions, the equation $3x + 5y + 15 = 0$ can have [1]
 (a) one only (b) exactly two
 (c) zero (d) infinite
- Q5. Two distinct intersecting lines l and m cannot have [1]
 (a) any point in common (b) one point in common
 (c) two points in common (d) None of these
- Q6. Supplement of angle is one fourth of itself. The measure of the angle is [1]
 (a) 18° (b) 36°
 (c) 144° (d) 72°
- Q7. In $\triangle ABC$, if $\angle B < \angle A$, then [1]
 (a) $BC > CA$ (b) $BC < CA$
 (c) $BC > AB + CA$ (d) $AB < CA$
- Q8. In the following figure, $ABCD$ and $AEFG$ are two parallelograms. If $\angle C = 55^\circ$, find $\angle F$. [1]



- (a) 65°
- (b) 75°
- (c) 85°
- (d) 55°

Q9. Which of the following figures lie on the same base and between the same parallels? [1]



Q10. In the given figure, O is the centre of circle. $\angle OPQ = 27^\circ$ and $\angle ORQ = 21^\circ$. The values of $\angle POR$ and $\angle PQR$ respectively are [1]



- (a) $84^\circ, 42^\circ$
- (b) $96^\circ, 48^\circ$
- (c) $54^\circ, 42^\circ$
- (d) $108^\circ, 54^\circ$

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

- Q11. If the lengths of two sides of an isosceles triangle are 4 cm and 10 cm, then the length of the third side is cm. [1]
 - Q12. The perimeter of a right angled triangle is 450 m. If its sides are in the ratio 5 : 12 : 13, then area of the triangle is m^2 . [1]
- OR**
- If each side of a scalene triangle is halved then its area will reduced by percentage.
- Q13. The sum of the areas of the plane and curved surfaces (faces) of a solid is called its surface area. [1]
 - Q14. is found by adding all the values of the observations and dividing this by the total number of observations. [1]
 - Q15. Probability of an event can be any from 0 to 1. [1]

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

Q16. If $125^x = \frac{25}{5^x}$, find the value of x . [1]

OR

What is the best way to evaluate $(996)^2$?

- Q17. In which quadrants, abscissa of a point is negative? [1]
- Q18. If two angles of a triangle are complementary, then what type of triangle will be formed? [1]
- Q19. What is the lateral surface area of a cuboid with dimensions l, b and h ? [1]
- Q20. If each observation of the data is decreased by 5, then what is the effect on the mean? [1]

SECTION B

Q21. Without actually calculating the cubes, find the value of $48^3 - 30^3 - 18^3$. [2]

OR

Find the value of x , if $5^{x-3} \times 3^{2x-8} = 225$.

- Q22. The polynomial $p(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$ when divided by $x + 1$, leaves the remainder 19. Find the value of a . Also, find the remainder when $p(x)$ is divided by $x + 2$. [2]

OR

Factorise : $2x^3 - 5x^2 - 19x + 42$.

- Q23. Find the coordinates of the point : [2]
 (i) Which lies on x and y axes both.
 (ii) Whose abscissa is 2 and which lies on the x -axis.

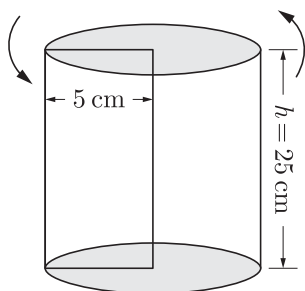
- Q24. If the complement of an angle is one-third of its supplement, find the angle ? [2]

OR

In $\triangle ABC$, if $\angle A = 50^\circ$ and $\angle B = 60^\circ$, determine the shortest and the longest side of the triangle.

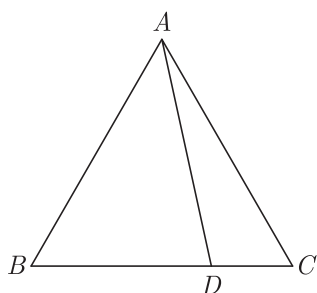
- Q25. $ABCD$ is a rhombus. If $AC = 8$ cm, $DB = 6$ cm, find the length of BC . [2]

- Q26. A rectangle strip 5 cm \times 25 cm is rotated completely about the 25 cm side. Find the total surface area of the solid thus generated. [2]



SECTION C

- Q27. In the given figure, $AB > AC$ and D is any point on side BC of $\triangle ABC$. Prove that $AB > AD$. [3]



- Q28. The remainder of the polynomial $5 + bx - 2x^2 + ax^3$, when divided by $(x - 2)$ is twice the remainder when it is divided by $(x + 1)$. Show that $10a + 4b = 9$. [3]
- Q29. The mean of first 8 observations is 18 and last 8 observation is 20. If the mean of all 15 observations is 19, find the 8th observation. [3]

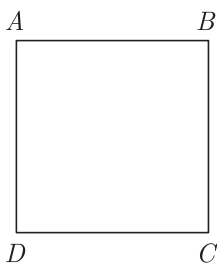
OR

Two coins are tossed simultaneously 200 times and the following outcomes are recorded :

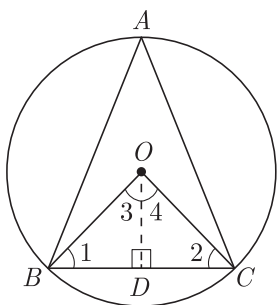
HH	HT/TH	TT
56	110	34

What is the empirical probability of occurrence of at least one head in the above case ?

Q30. In the given figure, $AB \parallel DC$ and $AD \parallel BC$. Prove that, $\angle DAB = \angle DCB$. [3]



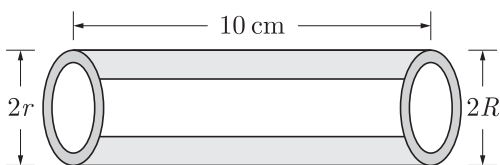
Q31. The circumcentre of the triangle ABC is O . Prove that $\angle OBC + \angle BAC = 90^\circ$. [3]



Q32. A spherical cannon ball, 28 cm, in diameter is melted into a right circular conical mould, the base of which is 35 cm in diameter. Find the height of the cone, correct to one place of decimal. [3]

OR

The total surface area of a hollow metal cylinder open at both ends of external radius 8 cm and height 10 cm is $338\pi \text{ cm}^2$. Taking r to be inner radius, find the thickness of the metal in the cylinder.

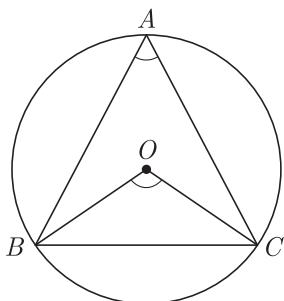


Q33. Construct a $\triangle ABC$ whose perimeter is 12 cm and sides are in the ratio 3 : 4 : 5. [3]

OR

Construct a triangle ABC in which $BC = 7 \text{ cm}$, $\angle B = 75^\circ$ and $AB + AC = 13 \text{ cm}$.

Q34. 3 STD booths situated at A , B and C in the figure are operated by handicapped persons. These three booths are equidistant from each other as shown in the figure. [3]



- (i) Find $\angle BAC$.
- (ii) Find $\angle BOC$

SECTION D

Q35. If $x = (5 + 2\sqrt{6})$, then show that $\sqrt{x} + \frac{1}{\sqrt{x}} = 2\sqrt{3}$. [4]

Q36. Factorise : $a^7 - ab^6$. [4]

Q37. Draw the graph of the equation $x - y = 3$. If $y = 3$, then find the value of x from the graph. [4]

OR

A and B are friends A is elder to B by 5 years. B 's sister C is half the age of B while A 's father D is 8 years older than twice the age of B . If the present age of D is 48 years, find the present ages of A , B and C .

Q38. Draw a frequency polygon representing the following frequency distribution. [4]

Class intervals	30-34	35-39	40-44	45-49	50-54	55-59
Frequency	12	16	20	8	10	4

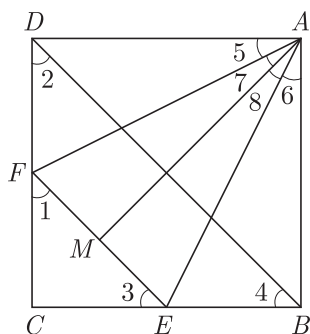
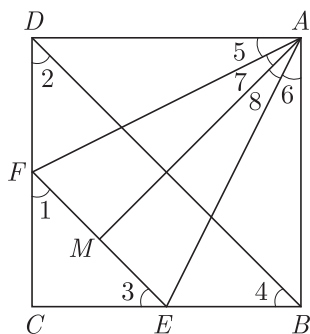
OR

The mean of 1, 7, 5, 3, 4 and 4 is m . The observations 3, 2, 4, 2, 3, 3 and p have mean $(m - 1)$ and median q . Find p and q .

Q39. The length of the sides of a triangle are in the ratio 3 : 4 : 5 and its perimeter is 144 cm. Find [4]

- (i) the area of the triangle
- (ii) the height corresponding to the longest side

Q40. In the given figure, $ABCD$ is a square, EF is parallel to diagonal BD and $EM = FM$. [4]



Prove that

- (i) $DF = BE$
- (ii) AM bisects $\angle BAD$.

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