Sample Paper 27

Class - 10th Exam - 2026 - 27

Mathematics - Basic

Time : 3 Hours **Max. Marks : 80**

General Instructions :

1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion - Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 Question of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = \frac{22}{7}$ wherever required if not stated.
11. Use of calculators is not allowed.

SECTION - A

Section A consists of 20 questions of 1 mark each.

1. If the first term of an AP is -5 and the common difference is 2, then the sum of the first 6 terms is

(a) 0 (b) 5

(c) 6 (d) 15

2. From an external point Q, the length of tangent to a circle is 12 cm and the distance of Q from the centre of circle is 13 cm. The radius of circle (in cm) is

(a) 10 (b) 5

(c) 12 (d) 7

3. If the point $P(k, 0)$ divides the line segment joining the points $A(2, -2)$ and $B(-7, 4)$ in the ratio $1 : 2$, then the value of k is

(a) 1 (b) 2

(c) -2 (d) -1

4. If one of the zeroes of a quadratic polynomial of the form $x^2 + ax + b$ is the negative of the other, then it

(a) has no linear term and the constant term is negative.

(b) has no linear term and the constant term is positive.

(c) can have a linear term but the constant term is negative.

(d) can have a linear term but the constant term is positive.

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5. The value of the polynomial $x^8 - x^5 + x^2 - x + 1$ is

(a) positive for all the real numbers (b) negative for all the real numbers

(c) 0 (d) depends on value of x

6. The sum of the areas of two circle, which touch each other externally, is $153\,\pi$. If the sum of their radii is 15, then the ratio of the larger to the smaller radius is

(a) 4 : 1 (b) 2 : 1

(c) 3 : 1 (d) None of these

7. The total number of factors of prime number is

(a) 1 (b) 0

(c) 2 (d) 3

8. Ratio of volumes of two cylinders with equal height is

(a) $H : h$ (b) $R : r$

(c) $R^2 : r^2$ (d) None of these

9. The point which divides the line segment joining the points $(8, -9)$ and $(2, 3)$ in the ratio 1 : 2 internally lies in the

(a) I quadrant (b) II quadrant

(c) III quadrant (d) IV quadrant

10. The co-ordinates of the point which is reflection of point $(-3, 5)$ in x-axis are

(a) $(3, 5)$ (b) $(3, -5)$

(c) $(-3, -5)$ (d) $(-3, 5)$

11. If $4\tan\theta = 3$, then $\left(\frac{4\sin\theta - \cos\theta}{4\sin\theta + \cos\theta}\right)$ is equal to

(a) $\frac{2}{3}$ (b) $\frac{1}{3}$

(c) $\frac{1}{2}$ (d) $\frac{3}{4}$

12. Value(s) of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is/are

(a) 0 (b) 4

(c) 8 (d) 0, 8

13. If the mean of the numbers $27 + x$, $31 + x$, $89 + x$ $107 + x, 156 + x$ is 82, then the mean of $130 + x$, $126 + x$, $68 + x$, $50 + x$, and $1 + x$ is

(a) 75 (b) 157

(c) 82 (d) 80

14. Aruna has only ₹ 1 and ₹ 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹ 75, then the number of ₹ 1 and ₹ 2 coins are, respectively

(a) 35 and 15 (b) 35 and 20

(c) 15 and 35 (d) 25 and 25

15. A girl calculates that the probability of her winning the first prize in a lottery is 0.08. If 6000 tickets are sold, then how many tickets has she bought?

(a) 40 (b) 240

(c) 480 (d) 750

16. If a pair of linear equations is consistent, then the lines will be

(a) Parallel (b) Always coincident

(c) Intersecting or coincident (d) Always intersecting

17. The sum and product of the zeroes of a quadratic polynomial are 3 and -10 respectively. The quadratic polynomial is

(a) $x^2-3x+10$ (b) $x^2+3x-10$

(c) $x^2-3x-10$ (d) $x^2+3x+10$

18. The 11th term of an AP $-5,\ \frac{-5}{2},\ 0,\ \frac{5}{2},$ ....., is

(a) -20 (b) 20

(c) -30 (d) 30

19. **Assertion :** In a circle of radius 6 cm, the angle of a sector 60°. Then the area of the sector is $18\frac{6}{7}\,\text{cm}^2$.
Reason : Area of the circle with radius r is πr^2.

(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 but 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.

20. **Assertion :** In the $\triangle ABC$, $AB=24\,\text{cm}$, $BC=10\,\text{cm}$ and $AC=26\,\text{cm}$, then $\triangle ABC$ is a right angle triangle.
Reason : If in two triangles, their corresponding angles are equal, then the triangles are similar.

(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 but 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.

SECTION - B

Section B consists of 5 questions of 2 marks each.

21. Find the ratio in which the point $P\left(\frac{3}{4},\frac{5}{12}\right)$ divides the line segment joining the point $A\ \left(\frac{1}{2},\frac{3}{2}\right)$ and $(2,-5)$.

22. Two tangents PA and PB are drawn from an external point P to a circle inclined to each other at an angle of 70°, then what is the value of $\angle PAB$?

23. If two positive integers p and q are written as $p = a^2b^3$ and $q = a^3b$, where a and b are prime numbers than verify $\text{LCM}(p,q) \times \text{HCF}(q,q) = pq$

OR

Prove that $3+\sqrt{5}$ is an irrational number.

24. The fifth term of an AP is 20 and the sum of its seventh and eleventh terms is 64. Find the common difference.

OR

For AP show that $a_p + a_{p+2q} = 2a_{p+q}$.

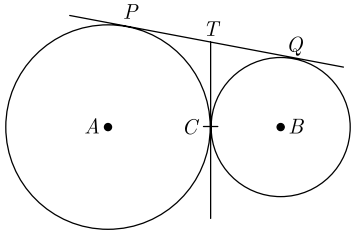
25. If the sum of first n terms of an AP is n^2, then find its 10th term.

SECTION - C

Section C consists of 6 questions of 3 marks each.

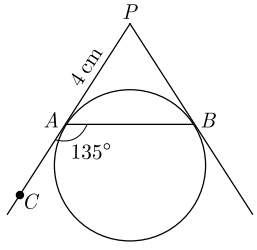
26. Solve for x : $\frac{1}{(x-1)(x-2)} + \frac{1}{(x-2)(x-3)} = \frac{2}{3}; x \neq 1,2,3$

27. In given figure, two circles touch each other at the point C. Prove that the common tangent to the circles at C, bisects the common tangent at P and Q.



OR

In the given figure, PA and PB are tangents to a circle from an external point P such that $PA = 4$ cm and $\angle BAC = 135^o$. Find the length of chord AB.



28. Solve for x and y :

$$\frac{x}{2} + \frac{2y}{3} = -1$$

$$x - \frac{y}{3} = 3$$

29. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/hour. How much area will it irrigate in 30 minutes; if 8 cm standing water is needed?

OR

The radii of two right circular cylinders are in the ratio of 2 : 3 and their height are in the ratio of 5 : 4 . Calculate the ratio of their curved surface area and radio of their volumes.

30. A die is thrown once. Find the probability of getting a number which (i) is a prime number (ii) lies between 2 and 6.

31. A 7 m long flagstaff is fixed on the top of a tower standing on the horizontal plane. From point on the ground, the angles of elevation of the top and bottom of the flagstaff are 60° and 45° respectively. Find the height of the tower correct to one place of decimal. (Use $\sqrt{3} = 1.73$)

SECTION - D

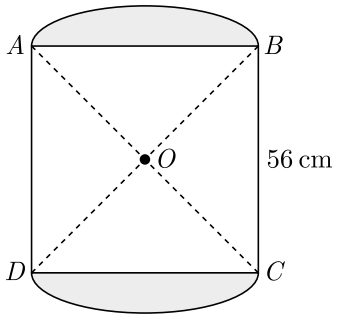
Section D consists of 4 questions of 5 marks each.

32. If α and β are zeroes of the polynomial $p(x) = 6x^2 - 5x + k$ such that $\alpha - \beta = \frac{1}{6}$, Find the value of k.

OR

Polynomial $x^4 + 7x^3 + 7x^2 + px + q$ is exactly divisible by $x^2 + 7x + 12$, then find the value of p and q.

33. In fig., two circular flower beds have been shown on two sides of a square lawn $ABCD$ of side 56 m. If the centre of each circular flower bed is the point of intersection O of the diagonals of the square lawn, find the sum of the areas of the lawn and flower beds.



34. Prove that in a right triangle, the square of the hypotenuse is equal to sum of squares of other two sides.

OR

Prove that in a right triangle, the square of the hypotenuse is equal to sum of squares of other two sides. Using the above result, prove that, in rhombus $ABCD$, $4AB^2 = AC^2 + BD^2$.

35. Given that $\tan(A+B) = \dfrac{\tan A + \tan B}{1 - \tan A \tan B}$, find the values of $\tan 75^\circ$ and $\tan 90^\circ$ by taking suitable values of A and B.

OR

Prove that : $\dfrac{\tan\theta}{1-\cot\theta} + \dfrac{\cot\theta}{1-\tan\theta} = 1 + \tan\theta + \cot\theta.$

SECTION - E

Section E consists of 3 case study based questions of 4 marks each.

36. Traffic Management : A traffic enforcement camera is a camera which may be mounted beside or over a road or installed in an enforcement vehicle to detect motoring offenses, including speeding, vehicles going through a red traffic light. A worldwide review of studies found that speed cameras led to a reduction of 11% to 44% for fatal and serious injury crashes. The British Medical Journal recently reported that speed cameras were effective at reducing accidents and injuries in their vicinity and recommended wider deployment.



In order to monitor reckless driving on Mumbai road, special cameras have been installed at many traffic light. The following table shows a frequency distribution table for the speed of 100 vehicles passing through a particular spot on a day.

Speed (in km/h)	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Number of Vehicles	1	3	7	16	35	29	7	2

Based on the above information, answer the following questions.

(i) Find the number of vehicles whose speed is more than 70 km/h and find the number of vehicles whose speed is less than 50 km/h ?

(ii) What is the mode value of speed ?

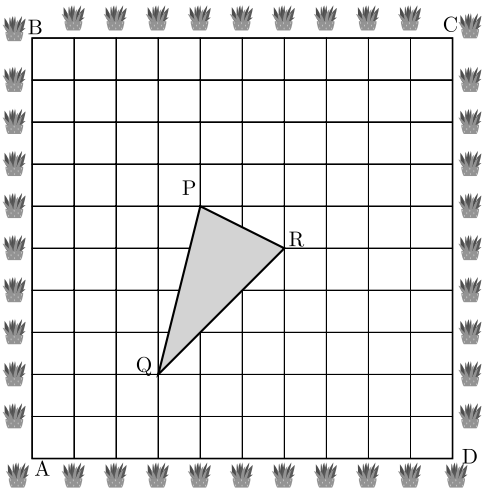
(iii) What is the median value of speed ?

OR

(iv) Find the mean value of speed using empirical relation.

37. A garden is in the shape of rectangle. Gardener grew sapling of Ashoka tree on the boundary of garden at the distance of 1 meter from each other. He want to decorate the garden with rose plants. He choose triangular region inside the park to grow rose plants. On the above situation, gardener took help from the students of class 10th. They made a chart for it which looks as the above figure.

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(i) If A is taken as origin, What are the coordinates of triangle PQR ?

(ii) If C is taken as origin, what is the co-ordinate of point P ?

(iii) If B is taken as origin, what are the co-ordinate of P ?

(iv) What is distance between P and Q if origin is taken A?

38. Pyramid, in architecture, a monumental structure constructed of or faced with stone or brick and having a rectangular base and four sloping triangular sides meeting at an apex. Pyramids have been built at various times in Egypt, Sudan, Ethiopia, western Asia, Greece, Cyprus, Italy, India, Thailand, Mexico, South America, and on some islands of the Pacific Ocean. Those of Egypt and of Central and South America are the best known.



The volume and surface area of a pyramid with a square base of area a^2 and height h is given by

$V = \frac{ha^2}{3}$ and $S = a^2 + 2a\sqrt{(\frac{a}{2})^2 + h^2}$

A pyramid has a square base and a volume of $3y^3 + 18y^2 + 27y$ cubic units.

(i) If its height is y, then what polynomial represents the length of a side of the square base ?

(ii) If area of base is 576 metre, what is the side of base?

(iii) What is the height of pyramid at above area of base ? What is the ratio of length of side to the height ?

OR

(iv) What is surface area of pyramid ?

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