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SAMPLE  
TEST PAPER  
**X Class**

Subject : Mathematics

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Gudha Public School Campus, Delhi Sikar Bypass Raod, NEEEMKATHANA, RAJ.

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SESSION 2025-2026

**Class 10<sup>th</sup>**

**MATHEMATICS**

**Test-01**

**Time: 180 Minutes**

**M.M.: 80**

**General Instructions:**

1. This Question paper contains - five sections A, B, C, D and E. Each section is compulsory.
2. Section A has 18 MCQ's 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.

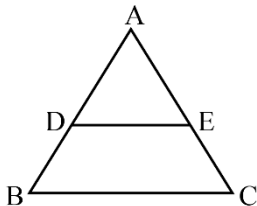
**SECTION-A**

1. The HCF of two numbers is 27 and their LCM is 162. If one of the numbers is 54, what is the other number  
(A) 36  
(B) 45  
(C) 9  
(D) 81
2. For what value of k, the pair of linear equations  $3x + y = 3$  and  $6x + ky = 8$  does not have a solution  
(A) 2  
(B) -2  
(C) 0  
(D) 1
3. The zeroes of the polynomial  $p(x) = x^2 - 27$  are:  
(A) 3, -3  
(B)  $\sqrt{3}, -\sqrt{3}$   
(C)  $3\sqrt{3}, -3\sqrt{3}$   
(D) 9, -9
4. Which of the following is a quadratic equation?  
(A)  $x^2 + 2x + 1 = (4 - x)^2 + 3$   
(B)  $-2x^2 = (5 - x)\left(2x - \frac{2}{5}\right)$   
(C)  $(k + 1)x^2 + \frac{3}{2}x = 7$ , where  $k = -1$   
(D)  $x^3 - x^2 = (x - 1)^3$
5. The 10<sup>th</sup> term of the AP: 5, 8, 11, 14, ... is:  
(A) 32  
(B) 35  
(C) 38  
(D) 185
6. If the sum of the first n terms of an AP is  $S_n = 3n^2 + 5n$ , then its common difference is:  
(A) 4  
(B) 6  
(C) 8  
(D) 10
7. The distance of the point P(-6, 8) from the origin is:  
(A) 8 units  
(B)  $2\sqrt{7}$  units  
(C) 10 units  
(D) 6 units

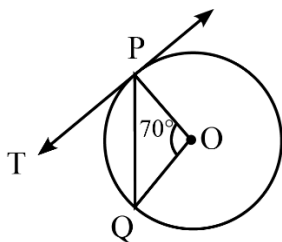
[1]

8. The coordinates of the point which divides the line segment joining the points (5, -2) and (9, 6) in the ratio 1:3 are:  
 (A) (6, 0)  
 (B) (7, 4)  
 (C) (3, 2)  
 (D) (4, 1)

9. In  $\triangle ABC$ ,  $DE \parallel BC$ . If  $AD = 3$  cm,  $DB = 4$  cm and  $AE = 6$  cm, then  $EC$  is:



- (A) 8 cm  
 (B) 12 cm  
 (C) 6 cm  
 (D) 4 cm
10. In the given figure,  $O$  is the centre of a circle,  $PQ$  is a chord and  $PT$  is the tangent at  $P$ . If  $\angle POQ = 70^\circ$ , then  $\angle TPQ$  is equal to:



- (A)  $55^\circ$   
 (B)  $70^\circ$   
 (C)  $45^\circ$   
 (D)  $35^\circ$
11. If  $\triangle ABC \sim \triangle DEF$  such that  $AB = 9.1$  cm and  $DE = 6.5$  cm. If the perimeter of  $\triangle DEF$  is 25 cm, then the perimeter of  $\triangle ABC$  is:  
 (A) 35 cm  
 (B) 28 cm  
 (C) 42 cm  
 (D) 40 cm
12. If  $2\sin^2\beta - \cos^2\beta = 2$ , then  $\beta$  is:  
 (A)  $0^\circ$  (B)  $90^\circ$   
 (C)  $45^\circ$  (D)  $30^\circ$

13. The median class of the following distribution is:

Class	Frequency
0-10	8
10-20	10
20-30	12
30-40	22
40-50	30

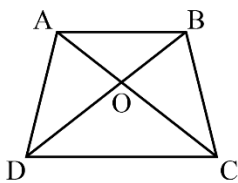
- (A) 20-30 (B) 40-50  
 (C) 30-40 (D) 10-20
14. For a frequency distribution, mean, median and mode are connected by the relation:  
 (A)  $\text{Mode} = 3 \text{ Mean} - 2 \text{ Median}$   
 (B)  $\text{Mode} = 2 \text{ Median} - 3 \text{ Mean}$   
 (C)  $\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$   
 (D)  $\text{Mode} = 3 \text{ Median} + 2 \text{ Mean}$
15. The length of the tangent from an external point  $A$  on a circle with centre  $O$  is:  
 (A) always greater than  $OA$   
 (B) always less than  $OA$   
 (C) always equal to  $OA$   
 (D) sometimes greater and sometimes less than  $OA$
16. A circle is inscribed in a quadrilateral  $PQRS$ . If  $PQ = 6$  cm,  $QR = 7$  cm and  $RS = 4$  cm, then  $SP$  is equal to:  
 (A) 3 cm (B) 4 cm  
 (C) 5 cm (D) 6 cm
17. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is:  
 (A) 22:7  
 (B) 14:11  
 (C) 7:22  
 (D) 11:14
18. A card is selected at random from a well shuffled deck of 52 cards. The probability of its being a red face card is:  
 (A)  $\frac{3}{26}$  (B)  $\frac{3}{13}$   
 (C)  $\frac{2}{13}$  (D)  $\frac{1}{2}$

19. **Assertion:** If the points A(4, 3) and B(x, 5) are on the circle with centre O(2, 3), then the value of x is 2.  
**Reason:** The distance between two point P(x<sub>1</sub>, y<sub>1</sub>) and Q(x<sub>2</sub>, y<sub>2</sub>) is given by  $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ .
- (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.  
 (B) Both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.  
 (C) Assertion is true, but Reason is false.  
 (D) Assertion is false, but Reason is true.

20. **Assertion:** The value of  $\sin\theta + \cos\theta$  is always greater than 1.  
**Reason:** For an acute angle  $\theta$ , the value of  $\sin\theta$  and  $\cos\theta$  lie between 0 and 1.
- (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.  
 (B) Both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.  
 (C) Assertion is true, but Reason is false.  
 (D) Assertion is false, but Reason is true.

## SECTION-B

21. (A) Show that  $5 + 2\sqrt{7}$  is an irrational number, given that  $\sqrt{7}$  is irrational.  
**OR**  
 (B) Find the HCF and LCM of 90 and 144 by the method of prime factorization.
22. Find the value of k for which the quadratic equation  $kx(x - 2) + 6 = 0$  has two equal roots.
23. In the given figure, if ABCD is a trapezium in which  $AB \parallel DC$  and diagonals intersect each other at point O, show that  $\frac{AO}{BO} = \frac{CO}{DO}$



24. The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower, is  $30^\circ$ . Find the height of the tower.
25. (A) Find the area of the sector of a circle with radius 4 cm and of angle  $30^\circ$ . Also, find the area of the corresponding major sector. (Use  $\pi = 3.14$ )  
**OR**  
 (B) A horse is tied to a peg at one corner of a square-shaped grass field of side 15 m by means of a 5 m long rope. Find the area of that part of the field in which the horse can graze.

## SECTION-C

26. Find the zeroes of the quadratic polynomial  $6x^2 - 3 - 7x$  and verify the relationship between the zeroes and the coefficients.
27. A fraction becomes  $\frac{1}{3}$  when 1 is subtracted from the numerator and it becomes  $\frac{1}{4}$  when 8 is added to its denominator. Find the fraction.

28. (A) Prove that the lengths of tangents drawn from an external point to a circle are equal.  
**OR**  
 (B) Prove that the parallelogram circumscribing a circle is a rhombus.
29. Prove that:  $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$

30. (A) How many terms of the AP: 9, 17, 25, ... must be taken to give a sum of 636?

OR

- (B) Find the sum of the odd numbers between 0 and 50.

31. A die is thrown twice. What is the probability that
- 5 will not come up either time?
  - 5 will come up at least once?
  - the sum of the numbers appearing on the top of the dice is 8?

### SECTION-D

32. (A) A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

OR

- (B) Two water taps together can fill a tank in  $9\frac{3}{8}$  hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

33. State and prove the Basic Proportionality Theorem (Thales' Theorem).

34. A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 7 cm and the height of the cone is equal to its diameter.

Find the volume of the solid. (Use  $\pi = \frac{22}{7}$ )

35. (A) The angle of elevation of the top of a building from the foot of the tower is  $30^\circ$  and the angle of elevation of the top of the tower from the foot of the building is  $60^\circ$ . If the tower is 50 m high, find the height of the building.

OR

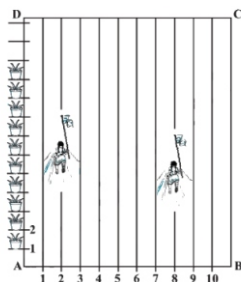
- (B) From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are  $30^\circ$  and  $45^\circ$ , respectively. If the bridge is at a height of 3 m from the banks, find the width of the river.

### SECTION-E

36. Read the text carefully and answer the questions:

To conduct a sports day activity, the physical education teacher of a school has marked a rectangular field ABCD with chalk lines at one-meter intervals. 100 flower pots have been placed at a distance of 1 m from each other along the line AD. The setup represents a coordinate plane where the lines are drawn along the x-axis and y-axis.

Two students, Niharika and Preet, take part in a flag-posting race. Niharika runs  $\frac{1}{4}$  of the distance AD on the 2<sup>nd</sup> line and posts a green flag. Preet runs  $\frac{1}{5}$  of the distance AD on the eighth line and posts a red flag.



Based on the above information, answer the following questions:

- Find the coordinates of the green flag.
- Find the coordinates of the red flag.
- (A) What is the distance between both the flag?

OR

- (B) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?

37. Read the text carefully and answer the questions:

Van Mahotsav is an annual tree planting festival celebrated in India to encourage environmental conservation and create awareness about the importance of trees. During a Van Mahotsav week, the Eco Club of a school decided to create a special herbal garden on a triangular plot of land to raise awareness about medicinal plants.

To plan the layout for watering and fencing, they marked the corners of the plot on a coordinate grid, with distances measured in meters. The vertices of the triangular plot are  $A(1, 4)$ ,  $B(5, 7)$ , and  $C(7, 2)$ .



Base on the above information, answer the following questions:

- (i) Find the length of the side  $AB$ .
- (ii) Find the coordinates of the midpoint of the side  $AC$ .
- (iii) (A) Find the area of the triangular plot  $ABC$ .

**OR**

- (B) Find the coordinates of the centroid of the triangle  $ABC$ .

**38. Read the text carefully and answer the questions:**

To promote financial literacy among students, a mathematics teacher decided to conduct a session on budgeting and saving. To make the session practical and relatable, the teacher first conducted a survey to understand the spending habits of the students by collecting data on their monthly pocket money.

The data on the monthly pocket money of 100 students of a class was compiled and is presented in the following frequency distribution table.

Pocket Money (in ₹)	Number of Students
0-20	10
20-40	15
40-60	30
60-80	35
80-100	10

Based on the above information, answer the following questions:

- (i) What is the class mark of the modal class?
- (ii) What is the cumulative frequency of the class 40-60?
- (iii) (A) Find the mean pocket money.

**OR**

- (B) Find the median pocket money.

