Sample Paper 19

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. Lowest value of $x^2 + 4x + 2$ is

(a) 0 (b) -2

(c) 2 (d) 4

2. If a regular hexagon is inscribed in a circle of radius r, then its perimeter is

(a) $3r$ (b) $6r$

(c) $9r$ (d) $12r$

3. The equation $2x^2 + 2(p+1)x + p = 0$, where p is real, always has roots that are

(a) Equal (b) Equal in magnitude but opposite in sign

(c) Irrational (d) Real

4. Two concentric circles are of radii 10 cm and 8 cm, then the length of the chord of the larger circle which touches the smaller circle is

(a) 6 cm (b) 12 cm

(c) 18 cm (d) 9 cm

5. If $\sin\theta - \cos\theta = 0$, then the value of $(\sin^4\theta + \cos^4\theta)$ is

(a) 1 (b) $\frac{3}{4}$

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

6. The sum of first 16 terms of the AP 10, 6, 2, ... is

(a) -320 (b) 320

(c) -352 (d) -400

7. A race track is in the form of a ring whose inner and outer circumference are 437 m and 503 m respectively. The area of the track is

(a) 66 sq. cm (b) 4935 sq. cm

(c) 9870 sq. cm (d) None of these

8. A fair die is thrown once. The probability of getting a composite number less than 5 is

(a) $\frac{1}{3}$ (b) $\frac{1}{6}$

(c) $\frac{2}{3}$ (d) 0

9. Which of the following statement is false?

(a) All isosceles triangles are similar. (b) All quadrilateral are similar.

(c) All circles are similar. (d) None of the above

10. Ratio of volumes of two cones with same radii is

(a) $h_1 : h_2$ (b) $s_1 : s_2$

(c) $r_1 : r_2$ (d) None of these

11. If a letter is chosen at random from the letter of English alphabet, then the probability that it is a letter of the word DELHI is

(a) $\frac{1}{5}$ (b) $\frac{1}{26}$

(c) $\frac{5}{26}$ (d) $\frac{21}{26}$

12. The pair of equations $y = 0$ and $y = -7$ has

(a) One solution (b) Two solutions

(c) Infinitely many solutions (d) No solution

13. The length of a string between a kite and a point on the ground is 85 m. If the string makes an angle θ with level ground such that $\tan\theta = \frac{15}{8}$, then the height of kite is

(a) 75 m (b) 78.05 m

(c) 226 m (d) None of these

14. If the angle of depression of an object from a 75 m high tower is 30°, then the distance of the object from the tower is

(a) $25\sqrt{3}$ m (b) $50\sqrt{3}$ m

(c) $75\sqrt{3}$ m (d) 150 m

15. If $x = p\sec\theta$ and $y = q\tan\theta$, then

(a) $x^2 - y^2 = p^2 q^2$ (b) $x^2 q^2 - y^2 p^2 = pq$

(c) $x^2 q^2 - y^2 p^2 = \frac{1}{p^2 q^2}$ (d) $x^2 q^2 - y^2 p^2 = p^2 q^2$

16. The median of a set of 9 distinct observations is 20.5. If each of the largest 4 observation of the set is increased by 2, then the median of the new set

(a) Is increased by 2

(b) Is decreased by 2

(c) Is two times the original median

(d) Remains the same as that of the original set

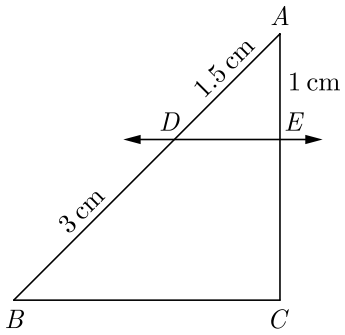
17. Mode of the following grouped frequency distribution is

Class	**Frequency**
3-6	2
6-9	5
9-12	10
12-15	23
15-18	21
18-21	12
21-24	03

(a) 13.6 (b) 15.6

(c) 14.6 (d) 16.6

18. In the given figure, $DE \parallel BC$. The value of EC is



(a) 1.5 cm (b) 3 cm

(c) 2 cm (d) 1 cm

19. **Assertion :** If in a circle, the radius of the circle is 3 cm and distance of a point from the centre of a circle is 5 cm, then length of the tangent will be 4 cm.

Reason : $(\text{hypotenuse})^2 = (\text{base})^2 + (\text{height})^2$

(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.

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20. **Assertion :** The equation $8x^2 + 3kx + 2 = 0$ has equal roots then the value of k is $\pm\frac{8}{3}$.

Reason : The equation $ax^2 + bx + c = 0$ has equal roots if $D = b^2 - 4ac = 0$

(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 mean of the following distribution :

Class	10-25	25-40	40-55	55-70	70-85	85-100
Frequency	2	3	7	6	6	6

OR

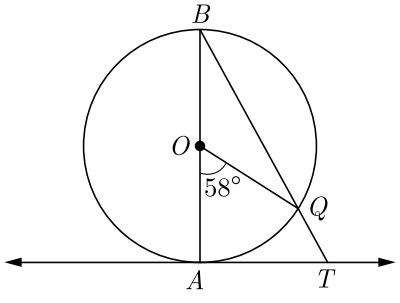
Find the mean of the following data :

Class	0- 20	20-40	40-60	60-80	80-100	100- 120
Frequency	20	35	52	44	38	31

22. $ABCD$ is a trapezium in which $AB \,||\, CD$ and its diagonals intersect each other at the point O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.

23. Find the value of $\cos 2\theta$, if $2\sin 2\theta = \sqrt{3}$.

24. In given figure, AB is the diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 58^\circ$, find $\angle ATQ$.



25. Show that $5\sqrt{6}$ is an irrational number.

OR

Write a rational number between $\sqrt{2}$ and $\sqrt{3}$.

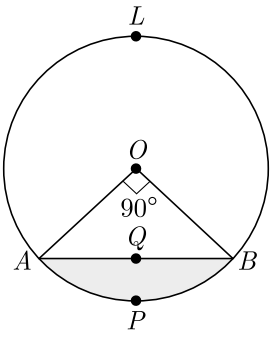
SECTION - C

Section C consists of 6 questions of 3 marks each.

26. A horse is tethered to one corner of a rectangular field of dimensions $70\,\text{m} \times 52\,\text{m}$, by a rope of length 21 m. How much area of the field can it graze?

OR

In the given figure, a chord AB of the circle with centre O and radius 10 cm, that subtends a right angle at the centre of the circle. Find the area of the minor segment $AQBP$. Hence find the area of major segment $ALBQA$. (Use $\pi = 3.14$)



27. Write the smallest number which is divisible by both 306 and 657.

28. Which term of the AP 20, $19\frac{1}{4}$, $18\frac{1}{2}$, $17\frac{3}{4}$, ... is the first negative term.

29. If $1 + \sin^2\theta = 3\sin\theta\cos\theta$, prove that $\tan\theta = 1$ or ½.

30. Find the mode of the following frequency distribution:

Class	15-20	20-25	25-30	30-35	35-40	40-45
Frequency	3	8	9	10	3	2

31. Find the ratio in which the segment joining the points $(1, -3)$ and $(4, 5)$ is divided by x-axis? Also find the coordinates of this point on x-axis.

OR

The vertices of ΔABC are $A(6, -2), B(0, -6)$ and $C(4,8)$. Find the co-ordinates of mid-points of AB, BC and AC.

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SECTION - D

Section D consists of 4 questions of 5 marks each.

32. A hemispherical depression is cut from one face of a cubical block, such that diameter l of hemisphere is equal to the edge of cube. Find the surface area of the remaining solid.

33. Two tangents PA and PB are drawn from an external point P to a circle with centre O, such that $\angle APB = \angle x$ and $\angle AOB = y$. Prove that opposite angles are supplementary.

34. Determine graphically the coordinates of the vertices of triangle, the equations of whose sides are given by $2y - x = 8$, $5y - x = 14$ and $y - 2x = 1$.

OR

Draw the graphs of the equations $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Determine the co-ordinates of the vertices of the triangle formed by these lines and the X-axis and shade the triangular region.

35. The person standing on the bank of river observes that the angle of elevation of the top of a tree standing on opposite bank is $60°$. When he moves 30 m away from the bank, he finds the angle of elevation to be $30°$. Find the height of tree and width of the river.

OR

As observed from the top of a 100 m high light house from the sea-level, the angles of depression of two ships are $30°$ and $45°$. If one ship is exactly behind the other on the same side of the light house, find the distance between the two ships [Use $\sqrt{3} = 1.732$]

SECTION - E

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

36. Maximum Profit : A kitchen utensils manufacturer can produce up to 200 utensils per day. The profit made from the sale of these utensils can be modelled by the function $P(x) = -0.5x + 175x - 330$, where $P(x)$ is the profit in Rupees, and x is the number of utensils made and sold. Based on this model,

(i) Find the y-intercept and explain what it means in this context.

(ii) Find the x-intercepts and explain what they mean in this context.

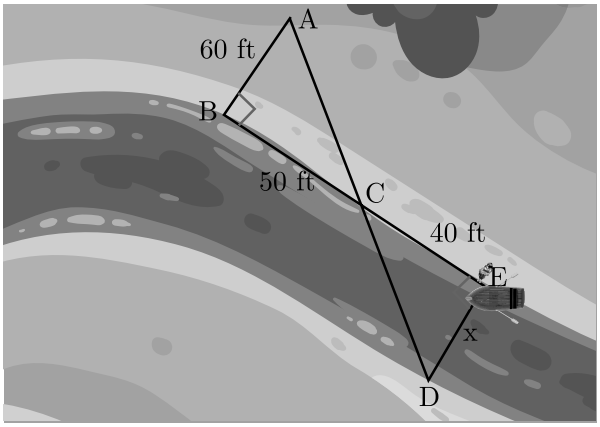
(iii) How many utensils should be sold to maximize profit?

OR

What is the maximum profit?



37. Tania is very intelligent in maths. She always try to relate the concept of maths in daily life. One day she plans to cross a river and want to know how far it is to the other side. She takes measurements on her side of the river and make the drawing as shown below.



(i) Which similarity criterion is used in solving the above problem ?

(ii) Consider the following statement :

$S_1 : \angle ACB = \angle DCE$

$S_2 : \angle BAC = \angle CDE$

Which of the above statement is/are correct.

(a) S_1 and S_2 both (b) S_1

(c) S_2 (d) None

(iii) Consider the following statement :

$$S_3 : \frac{AB}{DE} = \frac{CA}{CD}$$

$$S_4 : \frac{BC}{CE} = \frac{AB}{DE}$$

$$S_5 : \frac{CA}{CD} = \frac{DE}{AB}$$

Which of the above statements are correct ?

(a) S_3 and S_5 (b) S_4 and S_5

(c) S_3 and S_4 (d) All three

(iv) What is the distance x across the river?

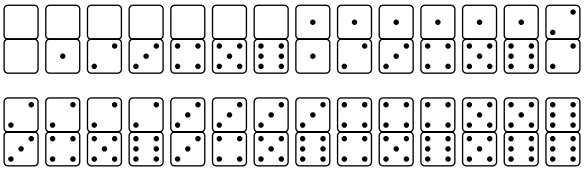
OR

What is the approximate length of AD shown in the figure?

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38. Double-six Dominos : It is a game played with the 28 numbered tiles shown in the diagram.





The 28 dominos are placed in a bag, shuffled and then one domino is randomly drawn. Give the following answer.

(i) What is the probability the total number of dots on the domino is three or less ?

(ii) What is the probability the total number of dots on the domino is greater than three ?

(iii) What is the probability the total number of dots on the domino does not have a blank half ?

OR

What is the probability the total number of dots on the domino is not a "double" (both sides the same) ?

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