केंद्रीय विद्यालय संगठन,अहमदाबाद संभाग **SET-A**

Kendriya Vidyalaya Sangathan, Ahmedabad Region

कक्षा दसवीं प्री-बोर्ड II परीक्षा 2025-26

Pre Board- II Examination 2025-26 for Class X

MATHEMATICS BASIC (241)

M.M.: 80 **TIME: 3 Hours**

GENERAL INSTRUCTIONS:

1. This question paper contains 38 questions. All Questions are compulsory.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and question no.19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Question numbers 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. There is no overall choice. However, an internal choice in 2 questions 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. Take π = 22 7 wherever required if not stated.
10. Use of calculators is not allowed.

SECTION-A

1 If the HCF of two positive integers a and b is 1, then their LCM is : 1
(a) a + b (b) a (c) b (d) ab

2 The pair of linear equation 3x + 5y = 3 and 6x + ky = 8 do not have a solution, if k is 1
(a) 5 (b) 10 (c) 15 (d) 20

3 If α, β are the zeroes of the polynomial $p(x) = 4x^2 - 3x - 7$, 1
then $(\frac{1}{\alpha}+\frac{1}{\beta})$ is equal to
(a) $\frac{7}{3}$ (b) $\frac{-7}{3}$ (c) $\frac{3}{7}$ (d) $\frac{-3}{7}$

4 The two roots of the equation $3x^2 - 2\sqrt{6}\,x + 2 = 0$ are : 1
(a) real and distinct (b) not real (c) real and equal (d) rational

5 The common difference of an A.P., if $a_{23} - a_{19} = 32$, is : 1
(a) 8 (b) – 8 (c) – 4 (d) 4

6 Two APs have the same common difference. The first term of one of these is –1 and that of the other is – 8. Then the difference between their 4th terms is 1
(a) 7 (b) 8 (c) 9 (d) 10

7 If sec θ − tan θ = m, then the value of sec θ + tan θ is: 1

(a) −m (b) $\frac{1}{m}$ (c) $1-\frac{1}{m}$ (d) m^2-1

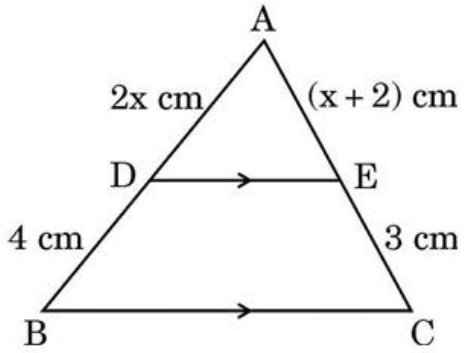
8 The mid-point of the line segment AB joining A(− 2, 8) and B(− 6, 4) is : 1

(a) (2, 6) (b) (− 4, 12) (c) (− 4, 6) (d) (4, − 6)

9 It is given that △ABC ~ △ DEF. If ∠A = 55°, ∠E = 45°, then ∠C is : 1

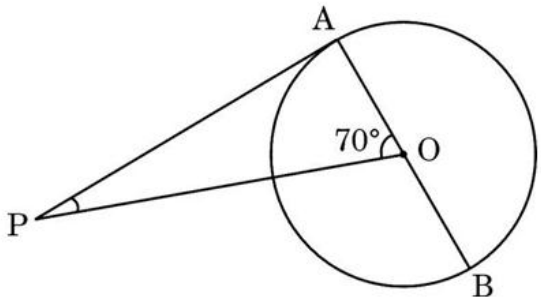
(a) 80° (b) 90° (c) 55° (d) 45°

10 In the given figure, in △ABC, DE || BC. If AD = 2x cm, AE = (x + 2) cm, DB = 4 cm, EC = 3 cm, then the value of x is: 1



(a) 3 (b) 2 (c) 6 (d) 4

11 In the given figure, PA is a tangent from an external point P to a circle with centre O. If ∠AOP = 70°, then the measure of ∠APO is : 1



(a) 70° (b) 20° (c) 110° (d) 90°

12 If $\tan^2\theta = 3$, where θ is an acute angle, then the value of θ is : 1

(a) 0° (b) 30° (c) 45° (d) 60°

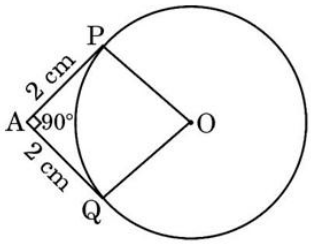
13 If the mean and mode of a frequency distribution are 28 and 16 respectively, then its median is : 1

(a) 22 (b) 23·5 (c) 24 (d) 24·5

14 If the difference of mode and median of a data is 24, then the difference of its median and mean is : 1

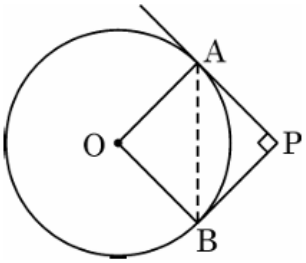
(a) 12 (b) 24 (c) 8 (d) 36

15 AP and AQ are tangents drawn from an external point A to a circle with centre O and inclined to each other at an angle of 90°. If the length of each tangent is 2 cm, then the radius of the circle is : 1



(a) 4 cm (b) 2 cm (c) 1 cm (d) 2√2

16 In the given figure, tangents PA and PB to the circle centred at O, from point P are perpendicular to each other. If PA = 5 cm, then length of AB is equal to 1



(a) 5√2 cm (b) 2√5 cm (c) 10 cm (d) 5 cm

17 The region between a chord and either of the two arcs of a circle is called : 1
(a) an arc (b) a sector (c) a segment (d) a semicircle

18 A box contains cards numbered 6 to 55. A card is drawn at random from the box. The probability that the drawn card has a number which is a perfect square, is 1

(a) $\frac{7}{50}$ (b) $\frac{7}{55}$ (c) $\frac{1}{10}$ (d) $\frac{5}{49}$

DIRECTION:
In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option:
(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 and 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.

19 Assertion (A) : A line drawn parallel to any one side of a triangle intersects the other two sides in the same ratio. 1
Reason (R) : Parallel lines cannot be drawn to any side of a triangle.

20 Assertion (A) : The probability of getting number 8 on rolling a die is zero (0). 1
Reason (R) : The probability of an impossible event is zero (0).

SECTION-B

21 Find the LCM and HCF of 92 and 510, using prime factorisation. 2

22 Prove that tangent at any point of a circle is perpendicular to the radius through the point of contact. 2

23 If α, β are zeroes of the quadratic polynomial $x^2 + 3x + 2$, find a quadratic polynomial whose zeroes are $\alpha + 1$, $\beta + 1$. 2

OR

If α, β are zeroes of the polynomial $p(x) = 5x^2 - 6x + 1$, then find the value of $\alpha + \beta + \alpha\beta$.

24 (a) Find the value of k for which the roots of the quadratic equation $5x^2 - 10x + k = 0$ are real and equal. 2

OR

(b) If one root of the quadratic equation $3x^2 - 8x - (2k + 1) = 0$ is seven times the other, then find the value of k.

25 Evaluate : $2 \tan^2 45° + \cos^2 30° - \sin^2 90°$. 2

SECTION-C

26 Prove that $\sqrt{3}$ is irrational. 3

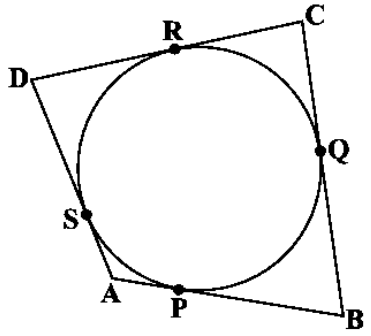
OR

In a teachers' workshop, the number of teachers teaching French, Hindi and English are 48, 80 and 144 respectively. Find the minimum number of rooms required if in each room the same number of teachers are seated and all of them are of the same subject.

27 Find the mean of the following data : 3

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Number of Students	3	5	16	12	13	20	6	5

28 A quadrilateral ABCD is drawn to circumscribe a circle (see Fig.). 3
Prove that AB + CD = AD + BC



29 The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number. 3

OR

Three years ago, Rashmi was thrice as old as Nazma. Ten years later, Rashmi will be twice as old as Nazma. How old are Rashmi and Nazma now ?

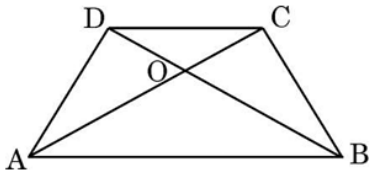
30 In $\triangle$ABC, right-angled at B, AB = 24 cm, BC= 7 cm. Determine : 3
(i) sin A, cos A, tan A
(ii) sin C, cos C, tan C

31 A chord of a circle of radius 10 cm subtends an angle of 60° at the centre. Find the area of the corresponding minor segments of the circle. 3
(Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)

SECTION-D

32 Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides at distinct points, then the other two sides are divided in the same ratio. 5

In a quadrilateral ABCD, diagonals AC and BD intersect each other at O such that $\frac{AO}{BO} = \frac{CO}{DO}$ as shown in the given figure. Prove that ABCD is a trapezium.



33 (a) The numerator of a fraction is 3 less than its denominator. If 2 is added to both numerator and denominator, then the sum of the new fraction and the original fraction is $1\frac{9}{20}$. Find the original fraction. 5

OR

(b) A train travelling at a uniform speed for 360 km would have taken 48 minutes less to travel the same distance if its speed were 5 km/h more. Find the original speed of the train.

34 A TV tower stands vertically on a bank of a canal. From a point on the other bank exactly opposite the tower, the angle of elevation of the top of the tower is 60°. From another point 20 m away from this point on the line joining this point to the foot of the tower, the angle of elevation of the top of the tower is 30°. 5

Find the height of the tower. [Use $\sqrt{3} = 1.732$]

OR

From a point on a bridge across the river, the angles of depressions of the banks on opposite sides of the river are 30° and 60° respectively. If the bridge is at a height of 4 m from the banks, find the width of the river.

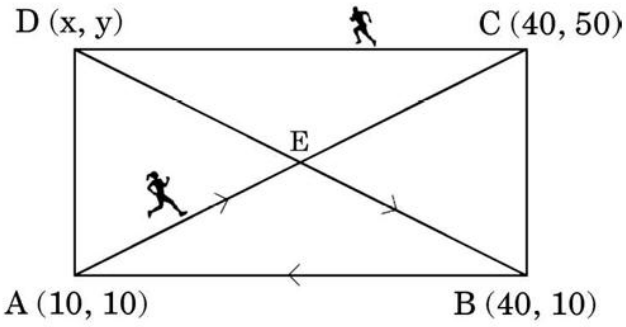
35 A vessel is in the form of a hemispherical bowl surmounted by a hollow cylinder of same diameter. The diameter of the hemispherical bowl is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel. Also, find the volume of the vessel. 5

SECTION-E

36 A field is in the form of a rectangle. The coordinates of the rectangular field ABCD are A(10, 10), B(40, 10), C(40, 50) and D(x, y).

Anil and Anita, two friends decided to have a race. Anita started from point A and moved to point E along the diagonal AC, where E is the point of intersection of both the diagonals of ABCD. From point E, she moved to point B along the other diagonal DB and then moved back to point A along BA. While Anil started from point C and ran to point A via D along the boundary of the field.





Based on the above information, answer the following questions :

(i) Find the coordinates of point E.

(ii) Find the distance between the points B and C. 1

(iii) (a) Find the coordinates of point D and the distance BD. 1

OR 2

(b) Find the total distance travelled by Anita.

37 Sumant's mother started a new shoe shop. To display the shoes, she put 3 pairs of shoes in the 1st row, 5 pairs in the 2nd row, 7 pairs in the 3rd row and so on.



Based on the above information, answer the following questions :

(i) How many pairs of shoes are displayed in the 6th row ? 1

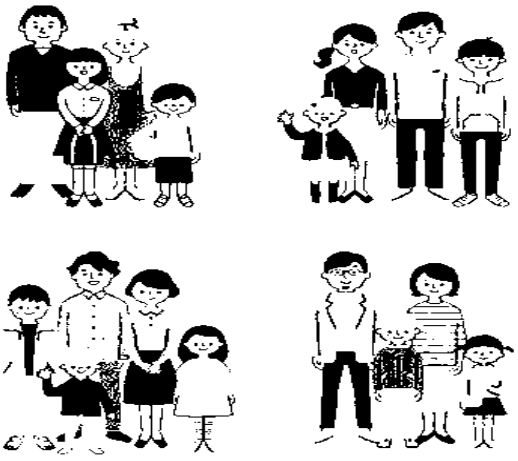
(ii) What is the difference of pairs of shoes in the 1st row and the 6th row ? 1

(iii) (a) Find the total number of pairs of shoes displayed in the first 15 rows. 2

OR

(b) If the pairs of shoes displayed in the 4th row are 'on sale' at price of Rs 500 for each pair, then find the total amount (money) earned by Sumant's mother if all shoes displayed in the 4th row are sold out.

38 Family structure : In a recent survey of this year, 51% of the families in the United States of America had no children, 20% had one child, 19% had two children, 7% had three children and 3% had four or more children.



A family is selected at random.

Based on the above information, answer the following questions :

(i) Find the probability that the selected family has two or three children.

(ii) Find the probability that the selected family has more than one child. 1

(iii) (a) Find the probability that the selected family has less than three children. 1

OR 2

(b) Find the probability that the selected family has more than two children.