केंद्रीय विद्यालय संगठन,अहमदाबाद संभाग

Kendriya Vidyalaya Sangathan, Ahmedabad Region

कक्षा दसवीं प्री-बोर्ड-I परीक्षा 2025-26

Pre Board I 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 The exponent of 3 in prime factorization of natural number 288 is: 1

(a) 5 (b) 4 (c) 3 (d) 2

2 If 2x + 3y = 0 and 4x – 3y = 0 then the value of (x + y) is 1

(a) 0 (b) -1 (c) 1 (d) 2

3 The zeroes of the quadratic polynomial $f(x) = x^2 - 99x + 127$ are 1

(a) both negative (b) both positive

(c) both equal (d) can not be determined

4 The quadratic equation $2x^2-\sqrt{3}x+1=0$ has 1

(a) two distinct real roots (b) two equal real roots

(c) no real roots (d) more than 2 real roots

5 The sum of first 100 multiples of 3 is 1

(a) 15130 (b) 15100 (c) 15120 (d) 15150

6 Which term of the AP 117, 113, … is its first negative term? 1

(a) $\frac{31}{4}$ (b) 29 (c) 31 (d) 32

7 $8cos^2A + 8sin^2A$ 1

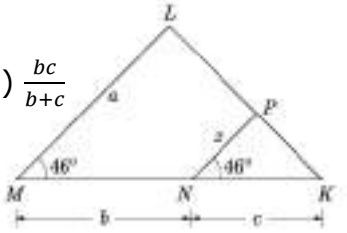
(a) 9 (b) 8 (c) 1 (d) 0

8 The coordinates of a point A, where AB is the diameter of a circle, whose centre is (-2,3) and B(4,8) is: 1

(a) (-8,-2) (b) (0,-14) (c) (-8,10) (d) (-6,-2)

9 The value of x is 1

(a) $\frac{ab}{a+b}$ (b) $\frac{ac}{a+c}$ (c) $\frac{ac}{b+c}$ (d) $\frac{bc}{b+c}$



10 ΔABC is such that AB=5 cm, BC = 2.5cm, CA = 7.5 cm. If $\Delta\ ABC \sim \Delta\ DEF$ and EF = 5cm, then perimeter of ΔDEF is 1

(a) 7.5cm (b) 15cm (c) 22.5cm (d) 30cm

11 The tangents drawn at the extremities of the diameter of a circle are 1

(a) Perpendicular (b) Parallel (c) equal (d) unequal

12 If $cosec\ \theta - \cot\theta\ = m$, then the value of $cosec\ \theta + \cot\theta$ is 1

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

13 The empirical relationship between the three measures of central tendency is 1

(a) 3 Median = Mode + 2 Mean (b) 2 Median = Mode + 2 Mean

(c) 3 Median = Mode + Mean (d) 3 Median = Mode – 2 Mean

14 The following frequency distribution gives the monthly consumers of electricity a locality. 1

CI	85 -104	105 -124	125 -144	145 -164	165 - 184
Frequency	5	13	20	14	8

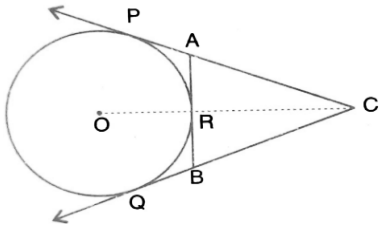
Find the difference between upper limit of modal class and lower limit of median class.

(a) 0 (b) 1 (c) 8 (d) 9

15 Calculate the volume of the hemispherical dome if the height of the dome is 21m. 1

(a) 19404 cu. m (b) 2000 cu .m (c) 15000 cu. M (d) 19000 cu. m

16 In the given figure, CP, CQ and BA are tangents to the circle. If CB = 5 cm, AC = 6 cm and AB = 8 cm then the length of AP is 1



(a)9 cm (b) 9.5 cm

(c)10 cm (d) 19 cm

17 A letter is chosen at random from the letters of the word 'VISUALISATION'. The probability that the letter chosen is vowel 1

(a) $\frac{4}{13}$ (b) $\frac{5}{13}$ (c) $\frac{6}{13}$ (d) $\frac{7}{13}$

18 If the circumference of two circles are in the ratio 4:9 then the ratio of their area will be 1

(a) 16:81 (b) 8 : 18 (c) 4 : 9 (d) 4 : 81

19 **ASSERTION (A):** Line joining the midpoints of two sides of triangle is parallel to the third side. 1

REASON (R): If a line divides two sides of a triangle in the same ratio then it is parallel to the third side.

(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(A):** A card is drawn at random from a well shuffled deck of 52 playing cards. The probability of getting a face card is 0.5 1

Reason (R): Probability of an event always lies between 0 and 1.

(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).

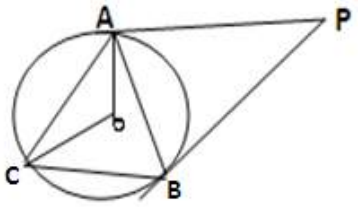
(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

SECTION-B

21 Find HCF and LCM of 72 and 120 2

22 In given figure O is center of the circum-circle of ΔABC. Tangents at A and B intersect P. If ∠APB = 80° and ∠AOC = 140° then find ∠CAB. 2



23 Evaluate: $\frac{\cos 45°}{\sec 30° + \operatorname{cosec} 30°}$ 2

24 Find the value(s) of k, if the quadratic equation $3x^2 - \sqrt{3}\,k\,x + 4 = 0$ has equal roots. 2

OR

Express the equation $\frac{1}{x} + \frac{1}{x+3} = \frac{9}{2}$ as a quadratic equation in standard form.

25 If α and β are zeroes of a quadratic polynomial $x^2 - 6x + 8$. Find the value of $\alpha^2 + \beta^2$ 2

SECTION-C

26 Show that $7 - 2\sqrt{5}$ is irrational. 3

OR

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

27 Find the median for the given frequency distribution: 3

Class	40-45	45-50	50-55	55-60	60-65	65-70	70-75
Frequency	2	3	8	6	6	3	2

28 Prove that length of the tangents drawn from an external point are equal. 3

29 How many natural numbers are there between 200 and 500 which are divisible by 8? 3

30 Prove that $(sin\theta + sec\theta)^2 + (cos\theta + cosec\theta)^2 = (1 + cosec\theta . sec\theta)^2$ 3

31 A part of monthly hostel charge is fixed and the remaining depends on the number of days one has taken food in the mess. When Swati takes food for 20 days, she has to pay Rs. 3,000 as hostel charges whereas Mansi who takes food for 25 days Rs. 3,500 as hostel charges. Find the fixed charges and the cost of food per day. 3

OR

The grocery store we use does not mark prices on its goods. My sister went to this store, purchased three 1-kg packages of almond and two 500-gram packages cashew, and paid a total of Rs 1345.

Not knowing that she went to the store, I also went to the same store, purchased two 1-kg packages of almond and three 500-gram packages cashew, and paid a total of Rs1145. Now we want to return two 1-kg packages of almond and two 500-gram packages cashew. How much will be refunded

SECTION-D

32 State and prove Basic proportionality theorem. 5

33 Solve: $\frac{1}{x+1} + \frac{2}{x+2} = \frac{4}{x+4}$, $x \neq -1, -2, -4$ 5

34 From the top of a building 60 meters high, the angles of depression to the top and bottom of a tower are observed to be 45° and 60° respectively. Find the height of the tower. Also, find the horizontal distance between the building and the tower. ($\sqrt{3} = 1.732\, m$) 5

35 From each end of a solid cylinder of height 20 cm and base radius 7 cm, a cone of base radius 2.1 cm and height 5 cm is scooped out. Find the volume of the remaining solid. 5

OR

A circus tent is in the shape of a cylinder surmounted by a conical top of same diameter. Their common diameter is 56 m and the height of cylindrical part is 6 m and the total height of the tent above the ground is 27 m, find the area of canvas used in the tent.

SECTION-E

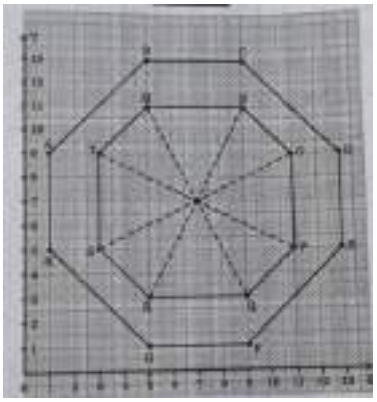
36 The top of a table is hexagonal in shape. 4

On the basis of the information given above information, answer the following:

i) Write the coordinates of A and D

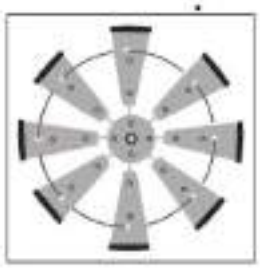
ii) Write the coordinates of the mid-point of line segment joining E & F

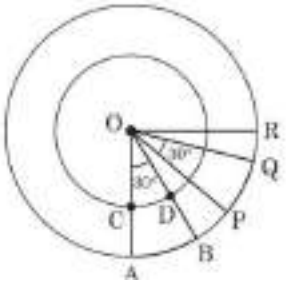
iii) Find the co-ordinates of the point which divides the line segment joining M and N in the ratio 1:3



37 A farmer has put up a decorative windmill in his farm in which there are eight blades of equal width and equally placed in a circular arrangement. 4

A circular wire goes through them.



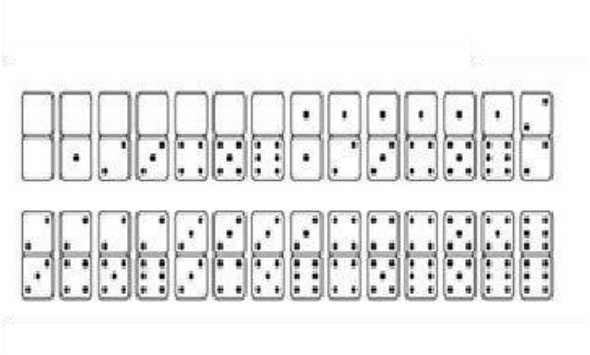


The diagram shows two blades OAB and OPQ in a quarter circle with centre O. ∠AOB = ∠POQ = 30°, OA = 28 cm, OC = 21 cm. O is the centre of both the circles. Determine the measure of BOP.
(ii) Find length of arc CD.
(iii) (a) Find the area of region CABD.
OR
(iii) (b) Find perimeter of region CABD.

38 Cards on which numbers 1, 2, 3……100 are written (one number on one card and no number is repeated), put in a bag and are mixed thoroughly.
A card is drawn at random from the bag. Find the following probability.
(i) What is the probability that card taken out has an odd number ?
(ii)What is the probability that card taken out has a two-digit odd number ?
(iii) What is the probability that card taken out has an odd number which is not less than 70?

OR

Double-six Dominos : It is a game played with 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 ? 1
(ii) What is the probability the total number of dots on the domino is greater than three ? 1
(iii) What is the probability the total number of dots on the domino does not have a blank half? 2
(iv) What is the probability the total number of dots on the domino is not a "double" (both sides the same) ?