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

**Kendriya Vidyalaya Sangathan, Ahmedabad Region**

कक्षा दसवीं/ बारहवीं प्री-बोर्ड **I** परीक्षा **2025-26**

**Pre Board-I Examination 2025-26 for Class X**

**SUBJECT: MATHEMATIC STANDARD (041)**

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

GENERAL INSTRUCTIONS:

Section A: Multiple Choice Questions (MCQs) and Assertion-Reason Based Questions (1 mark each)

Section B: Very Short Answer (VSA) Questions (2 marks each),

Section C: Short Answer (SA) Questions (3 marks each)

Section D: Long Answer (LA) Questions (5 marks each)

Section E: Case Study Based Questions (4 marks each, with sub-parts of 1, 1, and 2 marks)

## SECTION-A

1 If two positive integers p and q can be expressed as p = $18a^2b^4$ and q = $20a^3b^2$ where a and b are prime numbers, then LCM (p, q) is : 1

(a) $2a^2b^2$ (b) $180a^2b^2$

(c) $12a^2b^2$ (d) $180a^3b^4$

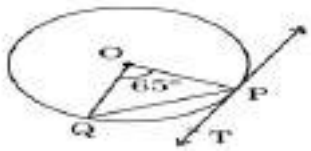
2 The center of a circle is at (2, 0). If one end of a diameter is at (6, 0) then the other end is at: 1

(a) (0,0) (b) (4,0) (c) (-2,0) (d) (-6,0)

3 If the lines 3x+2ky – 2 = 0 and 2x+5y+1 = 0 are parallel, then what is the value of k? 1

(a) 4/15 (b) 15/4 (c) ⅘ (d) 5/4

4 In the given figure, PT is tangent to a circle with centre O. Chord PQ subtends an angle of 65° at the centre. The measure of ∠QPT is 1




a)65° (b) 57.5°

(c) 67.5° (d) 32.5°

5 If sin θ=cos θ,(0°<θ<90°),then value of (secθ·sinθ)is 1

a) $\frac{1}{\sqrt{2}}$ (b)$\sqrt{2}$ (c) 1 (d) 0

6 If the roots of equation a$x^2$ + bx + c = 0, a # 0 are real and equal, then which of the following relation is true ? 1

( a) a=$\frac{b^2}{c}$ (b)$b^2$ =ac (c) ac=$\frac{b^2}{4}$ (d) c=$\frac{b^2}{a}$

7 If the circumference and area of a circle are numerically equal then the radius of the circle is 1

a) 1cm b) 4cm c) 2cm d) 3cm

8 Cards numbered 10, 11, 12,….. 30 are kept in a box and shuffled thoroughly. Rohit draws a card at random from the box. The probability that the number 1

on the card is a multiple of 4 or 5 is:
(a) $\frac{9}{20}$ (b) $\frac{9}{21}$ (c) $\frac{10}{20}$ (d) $\frac{10}{21}$

9 If sin θ + $sin^2$ θ =1,then the value of $cos^2$ θ + $cos^4$ θ is 1
a) 1 (b) $\frac{1}{2}$ (c)2 (d)3

10 The LCM of smallest 2-digit number and smallest composite number is (a) 12 1
(b)4 (c)20 (d)40

11 Three cubes each of side 15 cm are joined end to end. The total surface area of the cuboid is: 1
(a) 3150 $cm^2$ (b) 1575$cm^2$ (c) 1012.5 $cm^2$ (d) 576.4 $cm^2$

12 The zeroes of the quadratic polynomial $x^2$ + 99x + 127 are 1
(a) both positive (b) both negative
(c) one positive and one negative (d) both equal

13 What is the length of the arc of the sector of a circle with radius 14 cm and of central angle 90°? 1
(a) 22 cm (b) 44 cm (c) 88 cm (d) 11 cm

14 In Δ ABC, DE II BC and AD = 4cm, AB = 9cm, AC = 13.5cm then the value of EC is 1
(a) 6 cm (b) 7.5 cm (c) 9 cm (d) none of these

15 Which of the following can not be the probability of an event? 1
(a)$\frac{1}{3}$ (b) 0.99 (c)0.1 (d)$\frac{13}{12}$

16 M is a point on y-axis at a distance of 4 units from x-axis and it lies below the x-axis. The distance of point M from point Q (5, 1) is: 1
(a) √2 units (b) √34 units (c) √50 units (d) √90 units

17 The mode and mean is given by 7 and 8, respectively. Then the median is: 1
(a)$\frac{1}{13}$ (b) $\frac{13}{3}$ (c) $\frac{23}{3}$ (d)33

18 The length of a tangent drawn to a circle of radius 9 cm from a point at a distance of 41cm from the centre of the circle is 1
(a)40cm (b) 9cm (c) 41cm (d) 50cm

Questions number 19 and 20 are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.
(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the 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): Every composite number can be expressed as a product of primes, and this factorization is unique. 1
Reason (R): This is known as the Fundamental Theorem of Arithmetic.

20 Assertion: In a right ΔABC, right angled at B, if tan A=$\frac{12}{5}$, then Sec A=$\frac{13}{5}$ 1
Reason: cot A is the product of cot and A.

## SECTION-B

21 a) Check whether: – 150 is a term of the AP: 11, 8, 5, 2 . . . 2

**OR**

b)In an AP the sum of the first n terms is given by Sn = 6n - $n^2$. Find its 30$^{th}$ term.

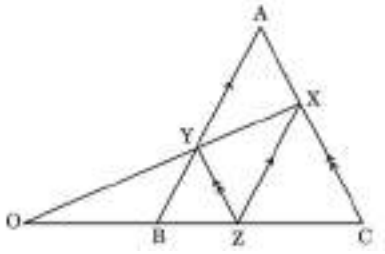
22 If cos (A+B)=$\frac{1}{2}$ and tan (A-B) =$\frac{1}{\sqrt{3}}$ where 0≤A+B ≤90° then find the value of sec (2A- 3B) 2

23 a) 2

If a line intersects sides AB and AC of Δ ABC at D and E respectively, and is parallel to BC, prove that $\frac{AD}{AB}=\frac{AE}{AC}$.

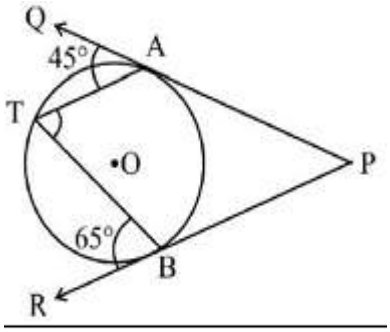
**OR**

b) In the given figure, Z is a point on the side BC of Δ ABC such that XZ || AB and YZ || AC. If XY and CB produced meet at O, then prove that $ZO^2$ =OB x OC.



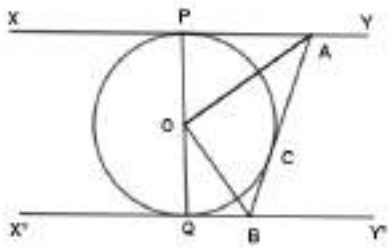

24 A chord is subtending an angle of 60° at the center of a circle of radius 21 cm. Find the area of the corresponding sector 2

25 In the given figure PAQ and PBR are tangents to the circle with center o at the points A and B respectively. If T is a point on the circle such that ∠QAT =45° and ∠TBR =65° ,then find ∠ATB 2




## SECTION-C

26 XY and X'Y' are two parallel tangents to a circle with center O and another tangent AB with the point of contact C intersecting XY at A and X'Y' at B. Prove that ∠ AOB = 90°. 3




27 Prove that √7 is an irrational number 3

28 Find the zeroes of the quadratic polynomial $2x^2 - (1+2\sqrt{2})\,x + \sqrt{2}$ and verify the relationship between the zeroes and coefficients of the polynomial. 3

29 a)If cosec A + cot A =m ,show that $\frac{m^2-1}{m^2+1}$= cos A 3

**OR**

b) $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + tan^2\,A + cot^2\,A$

30 All the black face cards are removed from a pack of 52 playing cards. The remaining cards are well shuffled and then a card is drawn at random. Find the probability of getting (i) face card (ii) red card (iii) black card. 3

31 a) Solve the following pair of linear equation 3

21x+ 47y=110

47x+ 21y= 162

**OR**

b) Solve for x and y: $\frac{x}{a} - \frac{y}{b} = 0$

$ax + by = a^2 + b^2$

## Section D

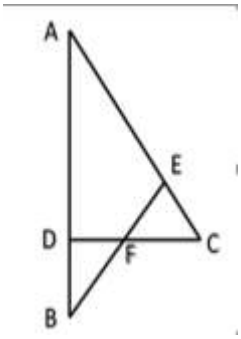
32 a)The age of a man is twice the square of the age of his son. Eight years hence, the age of the man will be 4 years more than three times the age of his son. Find their present ages 5

**OR**

b)If Nidhi were 7 years younger than what she actually is, then the square of her age (in years) would be 1 more than 5 times her actual age. What is her present age ?

33 (a) State and prove Thales theorem 5

b) In the given figure ∠CEF = ∠CFE. F is the midpoint of DC. Prove that $\frac{AB}{BD} = \frac{AE}{FD}$



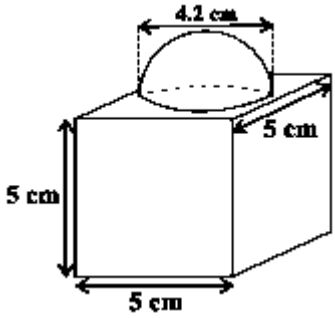

34 a) The largest possible hemisphere is drilled out from a wooden cubical block of side 21 cm such that the base of the hemisphere is on one of the faces of the cube. Find : 5

i)the volume of wood left in the block,

ii)the total surface area of the remaining Solid.

**OR**

b) The decorative block shown in the given figure is made of two solids - a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area of the block. (Take $\pi = \frac{22}{7}$)



35 The median of the following distribution is 545. If the sum of all frequencies is 100, then find the values of x and y. 5

| Class | Frequency |
|---|---|
| 0-100 | 3 |
| 100-200 | 4 |
| 200-300 | 5 |
| 300-400 | X |
| 400-500 | 17 |
| 500-600 | 20 |
| 600-700 | 19 |
| 700-800 | Y |
| 800-900 | 8 |
| 900-1000 | 3 |

## SECTION E

36 In order to organise, Annual Sports Day, a school prepared an eight lane running track with an integrated football field inside the track area as shown:

The length of innermost lane of the track is 400 m and each subsequent lane is 7.6 m longer than the preceding lane.

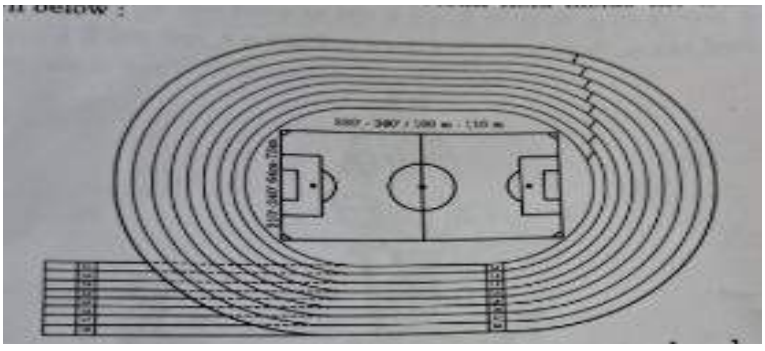
Based on given information, answer the following questions using

concept of Arithmetic Progression.

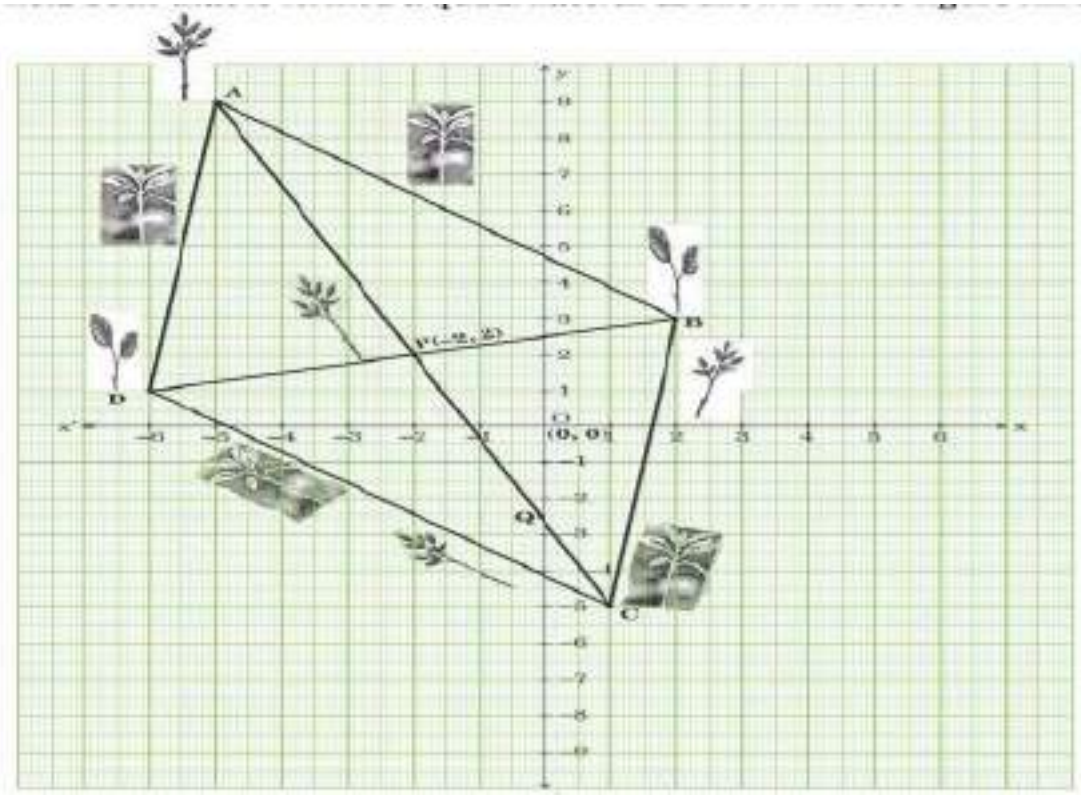
(i) What is the length of the 6th lane? 1

(ii) How long is the 8th lane than that of 4th lane? 1

(iii) (a) While practicing for a race, a student took one round each in first six lanes. Find the total distance covered by the student. 2
Or
b) A student took one round each in lane 4 to lane 8. Find the total distance covered by the student



37 Trees act the natural filters .By planting trees in and around school premises, we create cleaner and healthier air for students and local residents ,reducing respiratory problems. A school in Noida has proposed and organized a community drive on tree plantation under the title ‘save earth ,plant trees ’.students of that school have planted saplings in the field such that it formed a quadrilateral as shown in the figure ABCD




Based on the information given above, answer the following questions :

i) Find the distance between the two saplings at A and D. 1

ii) a)One student plants one sapling at the mid-point of AD. Then he moves along a straight line parallel to DB and sows another sapling on AB. What are the coordinates of the positions of these two new saplings ? 2

**OR**

(b) A new sapling is kept at a point M on DB such that DM : MB = 3 : 1. Find the coordinates of M. 1

iii)The line segments AC and BD bisect each other at P(-2, 2). Find the coordinates of C

38 Radio towers are essential for transmitting various communication services, including radio and television. These towers either function as antennas themselves or support one or more antennas on their structure. Following this concept, a radio station tower was constructed in two sections, A and B. The tower is supported by wires extending from a point O. Distance between the base of the tower and point O is 36 cm.From point O ,the angle of elevation of the top of the section B is 30° and the angle of elevation of the top of section A is 45°.

Find the length of the wire from the point O to the top of Section B.

Based on the above information answer the following questions use ( $\sqrt{3}$ =1.73)

(i) Find the length of the wire from the point O to the top of section B 1

(ii) (a) Find the distance AB. 2

**OR**

(b) Find the area of AOPB.

(iii) Find the height of the Section A from the base of the tower. 1

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