JAYPEE PUBLIC SCHOOL, NOIDA		
CLASS: X	SUBJECT: MATHEMATICS	EXAM.: PB-I
TIME: 3 Hrs.	M.M.:80	DATE: 18/11/2025
SUBJECT CODE: 041	PAPER CODE-JPSN/PB-I/2025-26	SET - A
NAME:		ROLL NO.:

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 questions 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 $\pi = 22/7$ wherever required if not stated.**
10. **Use of calculators is not allowed.**

SECTION-A (Multiple Choice Questions)

Q1. If α and β are zeroes of the polynomial $2x^2 - 9x + 5$ then the value of $\alpha^2 + \beta^2$ is $(\alpha+\beta)^2 - 2\alpha\beta$

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

(b) $\frac{61}{4}$

(c) 1

(d) $\frac{71}{4}$

Q2. A box contains cards numbered from 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

(a) $\frac{7}{50}$

(b) $\frac{7}{55}$

(c) $\frac{1}{10}$

(d) $\frac{5}{49}$

Q3. Point P divides the line segment joining the points A(4,-5) and B(1,2) in the ratio 5:2. Coordinates of point P are

(a) $(\frac{5}{2}, \frac{-3}{2})$

(b) $(\frac{11}{7}, 0)$

(c) $(\frac{13}{7}, 0)$

(d) $(0, \frac{13}{7})$

Q4. Two dice are rolled together. The probability of getting the sum of the two numbers to be more than 10 is

(a) $\frac{1}{9}$

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

(c) $\frac{7}{12}$

(d) $\frac{1}{12}$

Q5. The value of k for which the system of equations $3x - y + 8 = 0$ and $6x - ky + 16 = 0$ has infinitely many solutions is

(a) -2

(b) 2

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

(d) $\frac{-1}{2}$

Q6. The sum of first 200 natural numbers is

(a) 2010

(b) 2000

(c) 20100

(d) 21000

Q7. If the HCF(2520, 6600) = 40 and LCM(2520, 6600) = 252 × k then the value of k is

(a) 1650

(b) 1600

(c) 165

(d) 1625

Q8. XOYZ is a rectangle with vertices X(-3, 0), O(0, 0), Y(0, 4) and Z(x, y). The length of each diagonal is

(a) 5 units

(b) $\sqrt{5}$ units

(c) $x^2 + y^2$ units

(d) 4 units

Q9. The perimeters of two similar triangles ABC and PQR are 56 cm and 48 cm respectively, then $\frac{PQ}{AB}$ is equal to

(a) $\frac{7}{8}$

(b) $\frac{6}{7}$

(c) $\frac{7}{6}$

(d) $\frac{8}{7}$

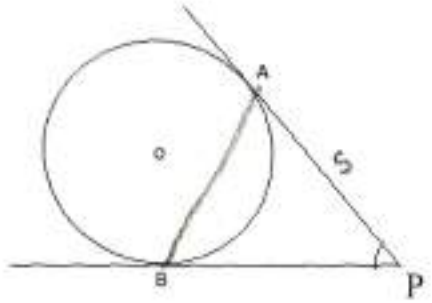
Q10. In the given figure, tangents PA and PB to the circle centered at O, from point P are perpendicular to each other. If PA = 5 cm, then length of AB is equal to

(a) 5 cm

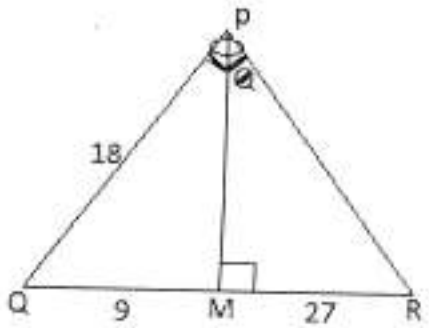
(b) $5\sqrt{2}$cm

(c) $2\sqrt{5}$ cm

(d) 10 cm.



Q11. Observe the figure then find cosΘ



(a) $\frac{1}{2}$

(b) $\frac{2}{1}$

(c) $\frac{2\sqrt{3}}{3}$

(d) $\frac{3\sqrt{3}}{2}$

Q12. If the area of a sector of a circle of radius 36 cm is 54π cm^2, then the length of the corresponding arc of the sector is

(a) 8π cm

(b) 6π cm

(c) 4π cm

(d) 3π cm

Q13. If every term of the Statistical data consisting of n terms is decreased by 2 then the mean of the data

(a) decreases by 2

(b) remains unchanged

(c) decreases by 2n

(d) decreases by 1

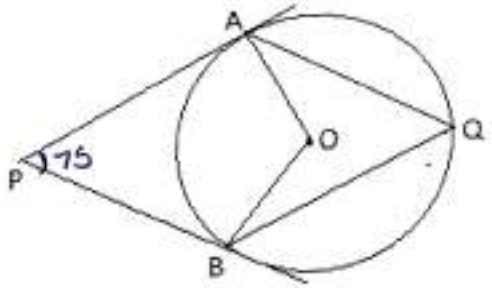
Q14. In the given figure, O is the Centre of the circle. PA and PB are tangents and angle APB = 75° then angle AQB is

(a) 52°

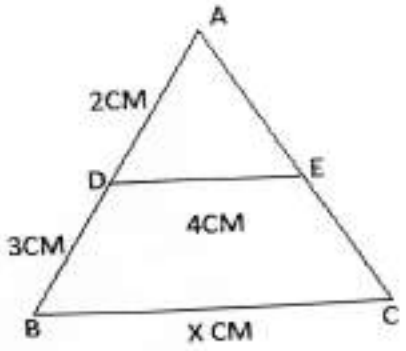
(b) $52\frac{1}{2}°$

(c) 62°

(d) $62\frac{1}{2}°$



Q15. In the given figure, DE ∥ BC. The value of x is



(a) 6

(b) 12.5

(c) 8

(d) 10

Q16. The fourth Vertex D of a parallelogram ABCD whose three vertices are A(-2, 3), B(6, 7), C(8, 3) is

(a) (0, 1)

(b) (0, -1)

(c) (-1, 0)

(d) (1, 0)

Q17. The next term of the AP $\sqrt{8}, \sqrt{18}, \sqrt{32}, \ldots$ is

(a) $5\sqrt{2}$

(b) $5\sqrt{3}$

(c) $3\sqrt{3}$

(d) $6\sqrt{3}$

Q18. If the discriminant of the quadratic equation $3x^2 - 2x + c = 0$ is 16 then the value of c is

(a) 1

(b) 0

(c) -1

(d) $\sqrt{2}$

DIRECTIONS: 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.

Q19. Assertion (A): If the product of the zeroes of the quadratic polynomial $x^2 + 3x + 5K$ is -10 then Value of K is -2.

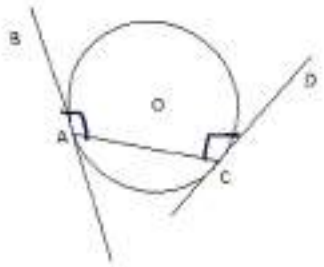
Reason (R): Sum of Zeroes of a quadratic polynomial $ax^2 + bx + c$ is $-\frac{b}{a}$.

Q20. Assertion (A): If three Consecutive terms 2K+1, 3K+3 and 5K-1 form an AP then K is equal to 6.

Reason (R): In an AP a, a+d, a+2d, ..., the Sum of first n terms of the AP is $S_n = (\frac{n}{2})[2a + (n-1)d]$.

SECTION-B

Q21. In the given figure AB and CD are tangents to a Circle Centered at O. Is angle BAC = angle DCA? Justify your answer.



Q22. (a) In what ratio is the line segment joining the points (3, -5) and (-1, 6) divided by the line y=x?

OR

A(3, 0), B(6, 4) and C(-1, 3) are Vertices of a triangle ABC. Find the length of its median BE.

Q23. Evaluate in the lowest form

$$\frac{COS45^O}{SEC30^O + COSEC30^O}$$

Q24. If a number x is chosen at random from the numbers {-3, -2, -1, 0, 1, 2, 3}. What is the probability that $x^2 \leq 4$?

OR

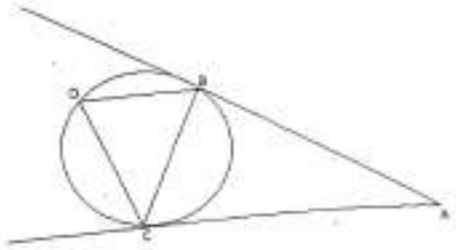
How many positive three digit integers have the hundredth digit 8 and unit's digit 5? Find the probability of selecting one such number out of all three digit numbers.

Q25. The HCF of 85 and 238 is expressible in the form 85m - 238. Find the Value of m.

SECTION-C

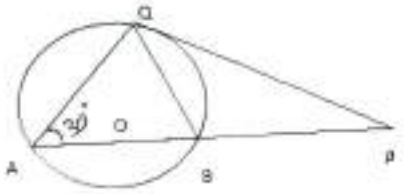
Q26. Prove that $\sqrt{3}$ is an irrational number.

Q27. (a) In the given figure, tangents AC and AB are drawn to a circle from a point A such that angle BAC = 30^{O} and a chord BD is drawn parallel to the tangent AC. Find angle DBC.



OR

(b) In the given figure, PQ is tangent to a circle Centered at O and angle BAQ = 30^{0}. Show that BP = BQ.



Q28. If the **mean** of the following distribution is **54**, then find the Value of P.

$\bar{x} = 54$

Class	0-20	20-40	40-60	60-80	80-100
Frequency	7	P	10	9	13

Q29. (a) In an AP, the sum of three consecutive terms is 24 and the sum of their squares is 194. Find the numbers.

OR

(b) The sum of first n terms of an AP is $Sn = 5n^2 + 3n$. If the m^{th} term is 168. Find the value of m. Also find the 20^{th} term of the AP.

Q30. Solve for x:

$$\frac{1}{2a+b+2x} = \frac{1}{2a} + \frac{1}{b} + \frac{1}{2x}$$

Q31. Prove that

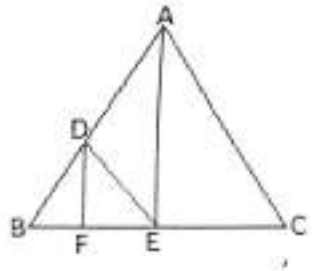
$$\frac{\sin\theta}{\cot\theta + cosec\,\theta} = 2 + \frac{\sin\theta}{\cot\theta - cosec\,\theta}$$

SECTION-D

Q32. (a) State Basic Proportionality Theorem and Prove.

OR

(b) In the given figure DE || AC and DF || AE. Prove that BF/FE = BE/EC.



Q33. The **median** of the following data is **35**. Find the Values of a and b.

C.I	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
f	10	20	a	40	b	25	15	170

Q34. Pinky Scored **40 marks** in a test getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks were

deducted for each wrong answer, Pinky again would have Scored 40 marks. **How many questions were there in the test?**

Q35. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length **TP**.

SECTION-E

Q36. Ms. Sheela visited a store near her house and found that the glass jars are arranged one above the other in a specific pattern. On the top layer there are 3 jars. In the next layer there are 6 jars. In the 3rd layer from the top there are 9 jars and so on till the 8th layer.

On the basis of the above situation answer the following questions

(i) Write an A.P whose terms represent the number of jars in different layers starting from top. Also, find the common difference.

(ii) Is it possible to arrange 34 jars in a layer if this pattern is continued? Justify your answer.

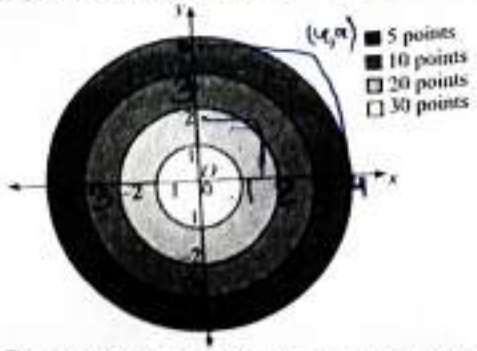
(iii) (a) If there are 'n' number of rows in a layer then find the expression for finding the total number of jars in terms of n. Hence find S_8.

OR

(b) The shopkeeper added 3 jars in each layer. How many jars are there in the 5th layer from the top?

Q37. Answer the questions based on the given information.

In the game of archery, a bow is used to shoot arrows at a target board. The player stands far away from the board and aims the arrow so that it hits the board. One such board, which is divided into 4 concentric circular sections, is drawn on a coordinate grid as shown.



Each section carries different points as shown in the figure. If an arrow lands on the boundary, the inner section points are awarded.

(i) After shooting two arrows, Rohan scored 25 points. Write one set of coordinates for each arrow that landed on the target.

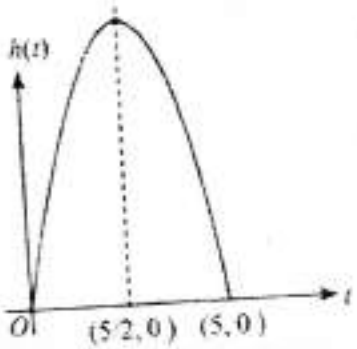
(ii) If one player's arrow lands on (2, 2.5), how many points will be awarded to the player?

(iii) One of Rohan's arrows landed on (1.2, 1.6). He wants his second arrow to land on the line joining the origin and first arrow such that he gets 10 points for it. Find one possible pair of coordinates of the second arrow's landing mark.

OR

An arrow landed on the boundary and is worth 20 points. The coordinates of the landing mark were of the form (m, -m). Find all such coordinates. Show your steps.

Q38. A ball is thrown in the air so that t seconds after it is thrown, its height H meter above its starting point is given by the polynomial: $h = 25t - 5t^2$



Observe the graph of the polynomial and answer the following questions:

(i) Write zeroes of the given polynomial.

(ii) Find the maximum height achieved by ball.

(iii) (a) After throwing upward, how much time did the ball take to reach to the height of 30 m?

OR

(iii) (b) Find the two different values of t when the height of the ball was 20m