COMMON PRE-BOARD EXAMINATION

MATHEMATICS (BASIC)–Code No. 041

CLASS-X-(2025-26)

SET: 1

Time allowed: 3 Hrs. **Maximum Marks: 80**

General Instructions:

Read the following instructions carefully and follow them:

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 $\pi = \frac{22}{7}$ wherever required if not stated.
10. Use of calculators is not allowed.

Q. No.	Questions	Marks
	SECTION A	
1.	HCF × LCM for the numbers 40 and 30 is : (A) 12 (B) 1200 (C)120 (D) 40	1
2.	If C(1, –1) is the mid-point of the line segment AB joining points A(4, x) and B(– 2, 4), then value of x is : (A) 6 (B) -6 (C) 3 (D) – 5	1
3.	For what values of k, the product of zeroes of the polynomial $kx^2 - 4x - 7$ is 2? (A) $-\frac{1}{14}$ (B) $-\frac{7}{2}$ (C) $\frac{7}{2}$ (D) $-\frac{2}{7}$	1
4.	Which of the following equations has 2 as a root? (A) $x^2 - 4x + 5 = 0$ (B) $x^2 + 3x - 12 = 0$ (C) $2x^2 - 7x + 6 = 0$ (D) $3x^2 - 6x - 2 = 0$	1
5.	If two circles touch externally, then the distance between their centres is equal to: (A) Sum of their radii (B) Difference of their radii (C) Product of their radii (D) Average of their radii	1

6. The distance between the points (2, – 1) and (– 1, – 5) is : 1

(A) 5 units (B) 15 units (C) 25 units (D) 41 units

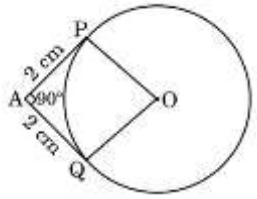
7. A die is rolled once. What is the probability of getting an odd prime number? 1

(A) $\frac{1}{6}$ (B) $\frac{1}{2}$ (C) $\frac{2}{3}$ (D) $\frac{1}{3}$

8. The discriminant of the quadratic equation $x^2 - 4x + 3 = 0$ is : 1

(A) -4 (B) 28 (C) 4 (D) – 8

9. 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) 4cm (B) $2\sqrt{2}$ cm (C) 2cm (D) 1cm

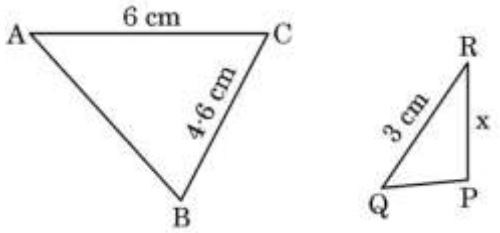
10. The 30th term of the AP 10, 7, 4, ... is : 1

(A) 87 (B) 77 (C) – 77 (D) – 87

11. If $cos\ \theta = \frac{p}{q}$, then $sin\ \theta$ is equal to : 1

(A) $\frac{q}{\sqrt{q^2-p^2}}$ (B) $\frac{p}{\sqrt{q^2-p^2}}$ (C) $\frac{\sqrt{q^2-p^2}}{q}$ (D) $\frac{q}{p}$

12. In the given figure, if Δ ABC ~ Δ QPR, then the value of x is : 1



(A) 5.3cm (B) 2.3 cm (C) 4.6 cm (D) 4 cm

13. The following distribution gives the daily income of 50 workers of a factory : 1

Income(₹)	400-424	425-449	450-474	475-499	500-524
No. of workers	12	14	8	6	10

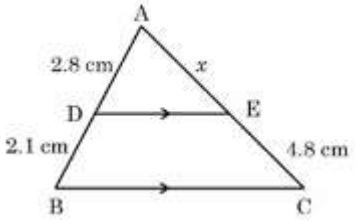
The lower limit of the modal class is:

(A) 425 (B) 449 (C) 424.5 (D) 425.5

14. The difference of the areas of a minor sector of angle 120° and its corresponding major sector of a circle of radius 21cm, is 1

(A) 231cm^2 (B) 462cm^2 (C) 346.5cm^2 (D) 693cm^2

15. If in the given figure, DE || BC. If AD = 2.8 cm, DB = 2.1 cm and EC = 4.8 cm, then the value of *x* is : 1



(A) 3.6 cm (B) 2.4 cm (C) 6.4 cm (D) 4.8 cm

16. The common difference of an A.P, whose nth term is given by a_n = 5n – 1, is : 1

(A) 1 (B) 6 (C) 5 (D) 4

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. The mean and median of a statistical data are 21 and 23 respectively. The mode of the data is: 1

(A) 27 (B) 22 (C) 17 (D) 23

Question numbers 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 options (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 Assertion (A).

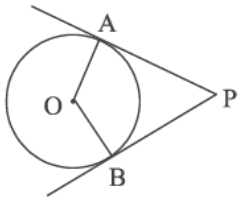
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

19. **Assertion (A):** If PA and PB are tangents drawn to a circle with centre O from an external point P, then the quadrilateral OAPB is a cyclic quadrilateral. 1

Reason (R): In a cyclic quadrilateral opposite angles are equal.



20. **Assertion (A):** The probability of winning a game is 0.4, then the probability of losing it, is 0.6. 1

Reason (R): P(E) + P (not E) = 1

SECTION B

21. (A) Using prime factorization, find the HCF and LCM of 6, 72 and 120. 2

OR

(B) There is a circular path around a sports field. Three cyclists start from the same point and at the same time and go in the same direction. If they take 30 minutes, 40 minutes and 48 minutes respectively to complete one round of the field, after how many minutes will they meet again at the starting point?

22. Prove that the tangents drawn at the end of a diameter of a circle are parallel. 2

23. Find the zeroes of the quadratic polynomial $6x^2 - 7x - 3$ and verify the relationship between the zeroes and the coefficients of the polynomial. 2

24. The product of two consecutive positive integers is 306. Find the integers using quadratic formula. 2

25. (A) Evaluate: sin A cos B + cos A sin B; if A=30° and B = 45° 2

OR

(B) Evaluate :$sin^2\ 30° + cos^2\ 45° - cos0° \times tan45°$

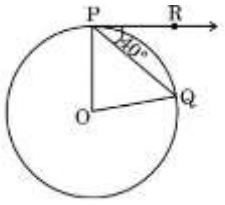
SECTION C

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

27. The following frequency distribution table gives the monthly consumption of electricity of 70 consumers of a locality. Find the median of the data. 3

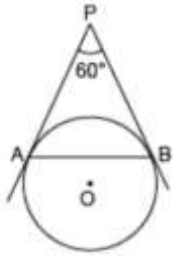
Monthly Consumption (in units)	Number of consumers
65 - 85	7
85 - 105	8
105 - 125	7
125 - 145	20
145 - 165	14
165 - 185	9
185 - 205	5

28. (A) If O is the centre of a circle, PQ is a chord and the tangent PR at P makes an angle of 40° with PQ, then find the measure of ∠ POQ. 3



OR

(B) In figure AP and BP are tangents to a circle with centre O such that AP= 5cm and $\angle APB = 60^{\circ}$, find the length of chord AB.



29. (A) The area of a rectangle get reduced by 9 square units, if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and breadth by 2 units, the area increases by 67square units. Find the dimension of the rectangle 3

OR

(B) Draw a graph of the equation $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Determine the coordinates of the vertices of the triangle formed by these lines.

30. Prove that: $(\sin\theta + \text{cosec}\,\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$ 3

31. Find the sum of all integers between 50 and 500 which are divisible by 7 3

SECTION D

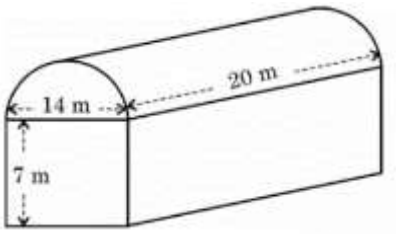
32. Prove that a line drawn parallel to one side of a triangle intersecting other two sides in distinct points, divides the other two sides in the same ratio. 5

33. (A) A train covers a distance of 300 km at a uniform speed. If the speed of the train is increased by 5 km/hr, it takes 2 hours less in the journey. Find the original speed of the train. 5

OR

(B) The ratio of monthly incomes of two persons is 9:7 and the ratio of their expenditures is 4: 3. If each of them manages to save ₹ 2,000 per month, then find their monthly incomes.

34. (A) A textile industry runs in a shed. This shed is in the shape of a cuboid surmounted by a half cylinder. If the base of the industry is of dimensions 14m × 20m and the height of the cuboidal portion is 7m, find the volume of air that the industry can hold. Further, suppose the machinery in the industry occupies a total space of 400 m^3. Then, how much space is left in the industry? 5



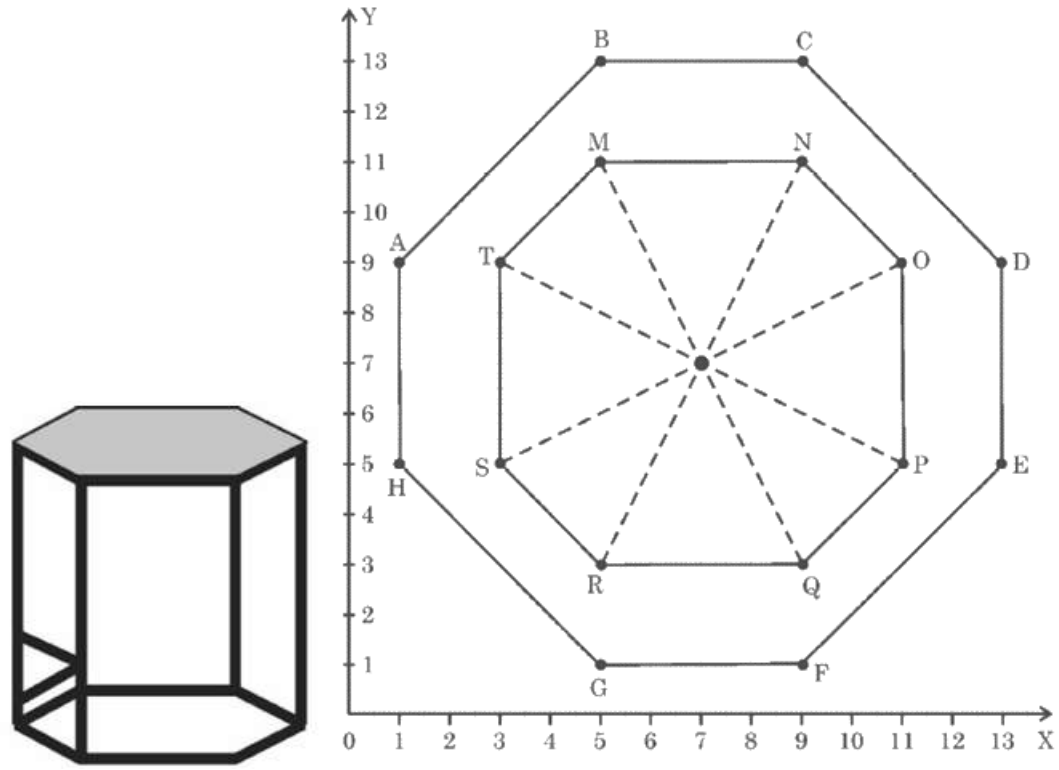
OR

(B) A toy is in the form of a cone of radius 7 cm mounted on a hemisphere of same radius. The total height of the toy is 31 cm. Find the surface area of the toy.

35. A statue, 1.6 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point, the angle of elevation of the top of the pedestal is 45°. Find the height of the pedestal. (Use $\sqrt{3} = 1.732$) 5

SECTION E

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



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

(i) Write the coordinates of A and B. 1

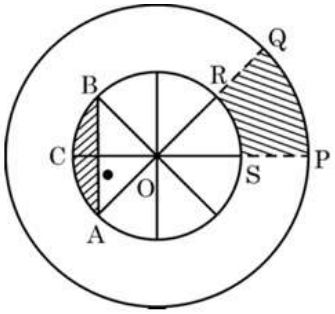
(ii) Write the coordinates of the mid-point of line segment joining C and D. 1

(iii) (A) Find the distance between M and Q. 2

OR

(iii) (B) Find the coordinates of the point which divides the line segment joining M and N in the ratio 1:3 internally.

37. NSS (National Service Scheme) aims to connect the students to the community and to involve them in problem solving process. NSS symbol is based on the 'Rath' wheel of the Konark Sun Temple situated in Odisha. The wheel signifies the progress cycle of life. The diagrammatic representation of the symbol is given below :



Observe the figure given above. The diameters of inner circle are equally placed. Given that OP = 21 cm, OS = 10 cm. Based on the above information, answer the following questions :

(i) Find ∠ROS. 1

(ii) Find the perimeter of sector OPQ. 1

(iii) (A) Find the area of shaded region PQRS. 2

OR

(iii)(B) Find the area of shaded region ACB i.e. the segment ACB.

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. 1

(ii) Find the probability that the selected family has more than two children. 1

(iii) (A)Find the probability that the selected family has more than one child. 2

OR

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