KOTHARI INTERNATIONAL SCHOOL, NOIDA

ANNUAL EXAMINATION, SESSION: 2025-26

GRADE: 9, SUBJECT: MATHEMATICS (041)

SET B

DATE & DAY: 9th FEBRUARY 2026, MONDAY

MAXIMUM MARKS: 80 **TIME ALLOTTED: 3 HOURS**

NAME: _____ **ROLL NUMBER: _____**

GENERAL INSTRUCTIONS:

i. *This Question Paper has 5 Sections A-E.*
ii. *Section A has 20 MCQs carrying 1 mark each.*
iii. *Section B has 5 questions carrying 02 marks each.*
iv. *Section C has 6 questions carrying 03 marks each.*
v. *Section D has 4 questions carrying 05 marks each.*
vi. *Section E has 3 case-based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.*
vii. *All Questions are compulsory. However, internal choice has been provided in each section*
viii. *Draw neat figures wherever required. Take π =22/7 wherever required if not stated.*

SECTION – A (20*1 = 20) Marks

Q1. $3\sqrt{20} - 2\sqrt{45} + 5\sqrt{20} - \sqrt{80}$ is equal to: (1)

$(a)\ 2\sqrt{5}$ (b) $4\sqrt{5}$ (c) $6\sqrt{5}$ (d $8\sqrt{5}$

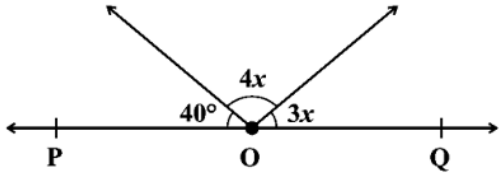
Q2. Which one of the following expressions can be irrational? (1)
(i) $\sqrt{2} + \sqrt{3}$ (ii) $\sqrt{4} + \sqrt{9}$ (iii)$2\sqrt{2}$ (iv)3

Choose the correct option from the following:
$(a)(i)\ and\ (iii)$ (b) $(i)\ and\ (ii)$ (c) $(i)\ and\ (iv)$ (d) $(ii)\ and\ (iii)$

Q3. The length of the diagonal of a cube is $8\sqrt{3}$ cm. Its surface area is: (1)

(a) 384 cm² (b) 256 cm² (c) 192 cm² (d)128cm²

Q4. In the figure given below, POQ is a line. The value of x is: (1)



(a) 20° (b) 25° (c) 30° (d) 35°

Q5. The curved surface area of a sphere is 196 cm². What is the radius of the sphere? (1)
(a) 7 cm (b) 3.5 cm (c) 14 cm (d) 10.5 cm

Q6. Age of a father is 5 years more than twice the present age of his son. If the present ages of the father and son are x years and y years respectively, the situation can be expressed as: (1)

(a) $x - 2y - 5 = 0$ (b) $x + 2y + 5 = 0$
(c) $x - 2y + 5 = 0$ (d) $x + 2y - 5 = 0$

Q7. Which are the zeroes of p(x) = x^2-4: (1)

(a) 1, −1 (b) −1, 2 (c) −2, 2 (d) −3, 3

Q8. A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the major arc: (1)

(a) 150° (b) 30° (c) 60° (d) none of these

Q9. If $(x-a)$ is a factor of $x^3 - mx^2 - 3anx + 2a^2n, a \neq 0$, then the value of a is: (1)

(a) $m + n$ (b) $m - n$ (c) $\frac{m}{n}$ (d) mn

Q10. If $x = k - 2$ and $y = 3k - 1$ satisfy the equation $2x + y - 5 = 0$, then the value of k is: (1)

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

Q11. If the area of an equilateral triangle is $4\sqrt{3}$ cm^2, then the perimeter of the triangle is: (1)

(a)24 cm (b) 12 cm (c) 36 cm (d) none of these

Q12. If x+y−2=0, then x^3+y^3-8 equals to: (1)

(a) $(x+y+2)^3$ (b)0 (c)6xy (d)-6xy

Q13. The area of a triangular sign board of sides 5cm, 12 cm and 13 cm is: (1)

(a) 30 cm^2 (b) 12 cm^2 (c) 60 cm^2 (d) $\frac{65}{2}$ cm^2

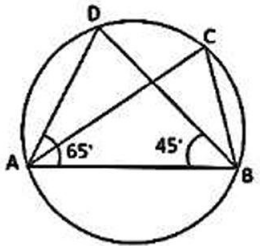
Q14. The adjusted frequency of the class interval 300-500 is 20. If the minimum class size is 50, then the initial frequency of this class interval was: (1)

(a) 20 (b) 100 (c) 80 (d) 50

Q15. If (2, 3b) = (-a, 3), then the values of a and b are: (1)

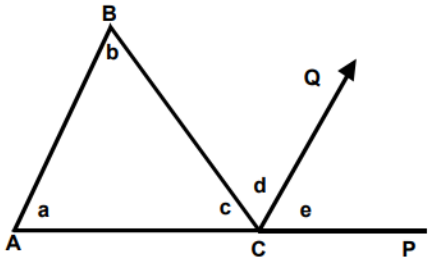
(a)a= 2, b=3 (b) a= 2, b= −1 (c) a= −2, b=3 (d) a = −2, b=1

Q16. In the given figure, if ∠DAB = 65°, ∠ABD = 45°, then find the value of ∠ACB+∠ABD. (1)



(a) 115° (b) 105° (c) 120° (d) 130°

Q17. In the adjoining figure, the sum of ∠a and ∠b is: (1)



(a) ∠c+∠d (b) ∠d+∠e (c) ∠b+∠c (d) ∠a+∠c

Q18. Which of the following is not true for a parallelogram? (1)

(a) opposite sides are equal
(b) opposite angles are equal
(c) opposite angles are bisected by the diagonals
(d) diagonals bisect each other.

Questions number 19 and 20 are Assertion and Reason based questions carrying 1 mark each. 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.

Q19. **Assertion (A):** $\left(\sqrt{x}\right)^3 + 1$ is a quadratic polynomial. (1)

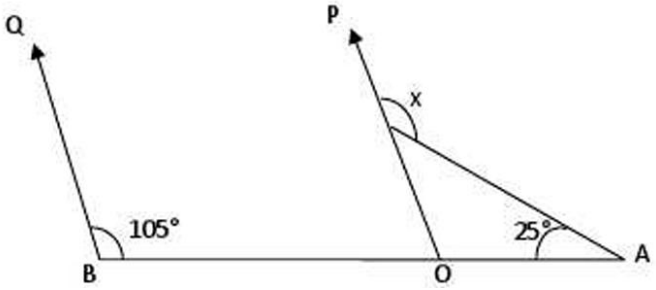
Reason (R): The degree of equation $2x^2 + 1$ is 2, which makes it a quadratic polynomial.

Q20. **Assertion (A):** For all values of k, $(-3/2, k)$ is a solution of the linear equation $2x + 3=0$ (1)

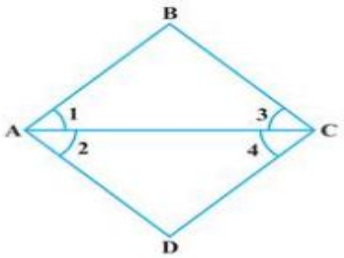
Reason (R): The equation $ax + b = 0$ can be expressed as a linear equation in two variables as $ax + y + b=0$.

SECTION – B (5 * 2= 10)

Q21. Find the value of x, if BQ || OP. (2)



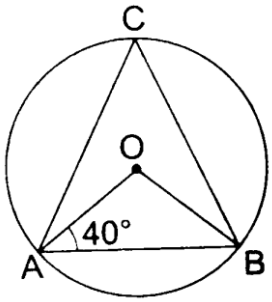
Q22. In the given figure, we have $\angle 1 = \angle 2$, $\angle 2 = \angle 3$. Show that $\angle 1 = \angle 3$. (2)



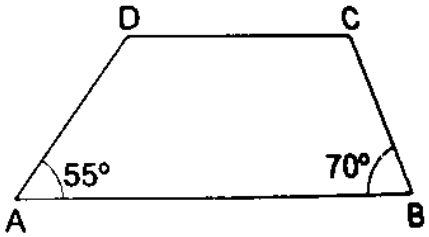
Q23. Prove that "The perpendicular from the centre of a circle to a chord bisects the chord." (2)

OR

In ΔABC, In the below figure, if $\angle OAB = 40^0$, then find ∠ACB.



Q24. In the adjoining figure, ABCD is a trapezium in which AB || DC. IF ∠A = 55° and ∠B = 70°, then find ∠C and ∠D. (2)



Q25. Find volume of a cone of radius 5 cm and slant height 13cm? (2)

OR

What is length of diagonal of a cube of side 7 cm?

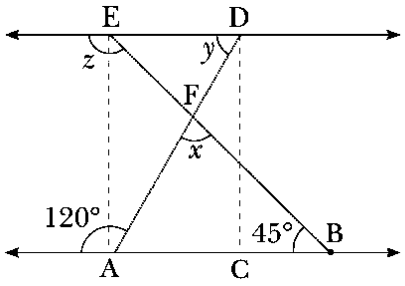
SECTION – C (6*3 = 18)

Q26. Prove that: $\frac{(x^{a+b})^2(x^{b+c})^2(x^{c+a})^2}{(x^a x^b x^c)^4} = 1$ (3)

OR

If $a = 7 + 4\sqrt{3}$, then find the value of $a^2 + \frac{1}{a^2}$.

Q27. If we draw two imaginary lines AE and CD and name the angles as shown below, then find the measure of x, y and z. (3)



Q28. Factorise $x^3 - 5x^2 - 2x + 24$ (3)

OR

The polynomial $x^3 + mx^2 - x + 6$ has $(x - 2)$ as a factor and leaves a remainder n when divided by $(x - 2)$. Find the values of m and n.

Q29. Two vertices of an equilateral triangle are (0, 2) and $(0, -2)$. Find the possible coordinates of the third vertex. (3)

Q30. In a test, a boy gets 4 marks for each correct answer and loses 1 mark for each incorrect answer. If he gives x correct answer, y incorrect answers and gets 20 as total marks. Write this situation in the form of linear equation. Also write the value of a, b and c. (3)

Q31. A triangle has sides 35 cm, 54 cm and 61 cm long. Find its area. Also find longest of its altitudes. (3)

SECTION – D (4 * 5 = 20)

Q32. The following table gives the distribution of students of two sections according to the marks obtained by them: (5)

Section A		Section B	
Marks	**Frequency**	**Marks**	**Frequency**
0 - 10	3	0 - 10	5
10 - 20	9	10 - 20	19
20 - 30	17	20 - 30	15
30 - 40	12	30 - 40	10
40 - 50	9	40 - 50	1

Represent the marks of the students of both the sections on the same graph by two frequency polygons. From the two polygons compare the performance of the two sections.

Q33. AB and CD are two parallel chords of a circle such that AB = 10 cm and CD = 24 cm. If the chords are on the opposite sides of the centre and the distance between them is 17 cm, find the radius of the circle. (5)

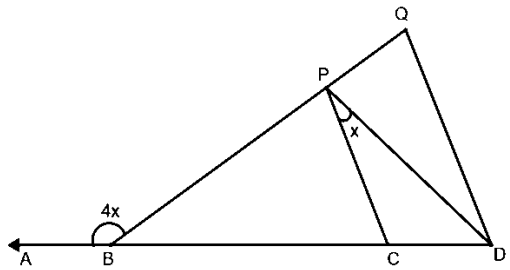
OR

AB and AC are two chords of a circle of radius r such that AB = 2AC. If p and q are the distances of AB and AC from the centre then prove that $4q^2 = p^2 + 3r^2$.

Q34. In the given figure, AD and BQ are straight lines. BP = BC and DQ|| CP. If ∠AEB = 4x and that ∠CPD = x, prove that (5)

(i) CP=CD

(ii) DP bisects that ∠CDQ

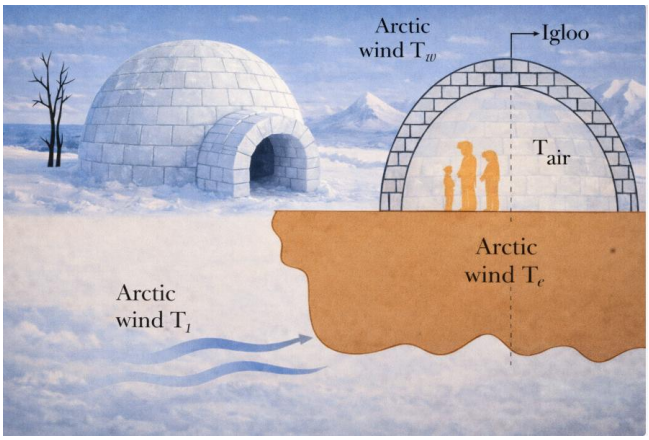


Q35. Factorise: (5)

$$\left(\frac{x}{2}+y+\frac{z}{3}\right)^3+\left(\frac{x}{3}-\frac{2y}{3}+z\right)^3+\left(-\frac{5x}{6}-\frac{y}{3}-\frac{4z}{3}\right)^3$$

SECTION-E (3 * 4 =12)

Q36. In the Arctic region, hemispherical houses called Igloos are made of ice. It is possible to maintain a temperature inside an Igloo as high as 20°C because ice has low thermal conductivity.



An Igloo is built in the shape of a hemisphere, with an inner diameter of 4.2m and walls of compacted snow that are 0.7m thick.

Based on the above information, answer the following questions:

(a) Find the volume of air in the Igloo. (1)

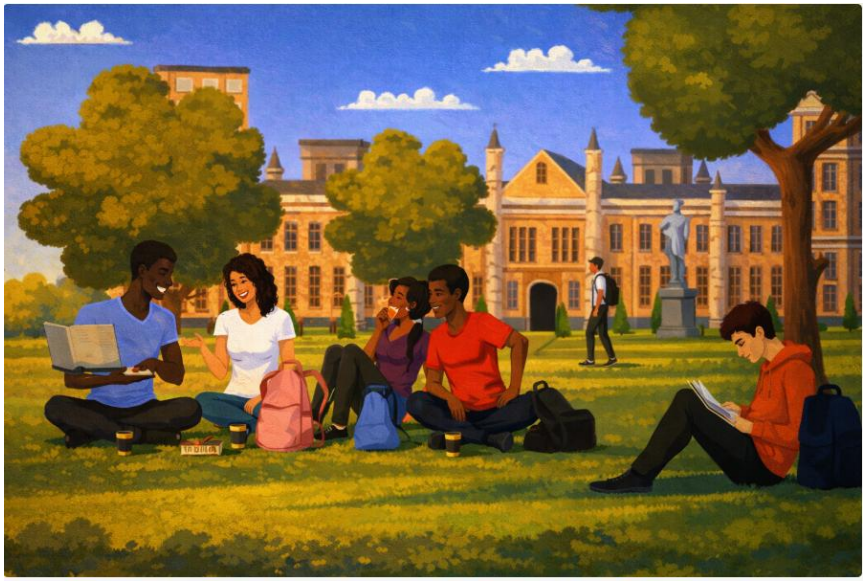
(b) What is the outer diameter of the Igloo? (1)

(c) If each person needs 4.62 m^3 of air to breathe, find how many persons may be accommodated in the Igloo? (2)

OR

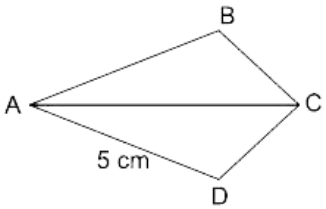
Find the outer surface area of the hemispherical part of the Igloo, given that the area of the door is 6.28m^2.

Q37. One day, Sport's teacher was absent in the school. So, all the students of class IX were making noise in the playground. HOD allotted that period to maths teacher, so to made all students busy, gave three following problems on triangles. Students started solving them.



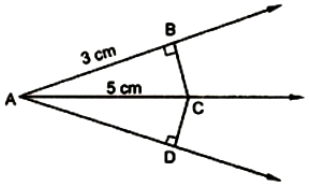
Based on the above information, answer the following questions:

(i) In the given figure, AC bisects ∠A and ∠C. if AD = 5cm, then find AB.



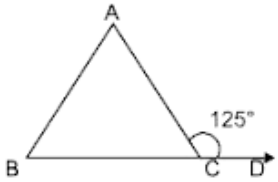
(1)

(ii) In given figure, ∠BAC = ∠DAC, then by which congruence rule ΔABC ≅ ΔADC?



(1)

(iii) In given figure, AB=AC and ∠ACD =125^0. Find ∠A.



(2)

Q38. In a school, one day Maths teacher told the students of class 9th about the number systems. She drew a number line and explained to them that the number The represents various types of numbers on it. Rational numbers can be represented ca the number line. A number is called a rational number if it can be written in the form of p/q, where p and q are integers and $q \neq 0$.

Based on above information, answer the following questions:

(i) Find an Irrational number between $\sqrt{3}$ and $\sqrt{5}$. (1)

(ii) Find a rational number between $\sqrt{3}$ and $\sqrt{5}$. (1)

(iii) locate $\sqrt{9.3}$ on the number line. (2)

OR

Represent $\sqrt{5}$ on number line.