Roll No. | | | | | | | |

DAV PUBLIC SCHOOLS, ODISHA ZONE
ANNUAL EXAMINATION, 2025-26

- Please check that this question paper contains 07 printed pages.
- Check that this question paper contains 38 questions.
- Write down the Serial Number of the question in the left side of the margin before attempting it.
- 15 minutes time has been allotted to read this question paper. The question paper will be distributed 15 minutes prior to the commencement of the examination. The students will read the question paper only and will not write any answer on the answer script during this period.

CLASS- IX

SUBJECT- MATHEMATICS

Time Allowed: 3 Hours **Maximum Marks : 80**

General Instructions :

1. *This Question paper has 5 Sections **A-E**.*
2. *Section A has 20 MCQs carrying 1 mark each.*
3. *Section B has 05 questions carrying 02 marks each.*
4. *Section C has 06 questions carrying 03 marks each.*
5. *Section D has 04 questions carrying 05 marks each.*
6. *Section E has 03 Case Based integrated units of assessment (04 marks) with subparts of the values of 1,1 and 2 marks each respectively.*
7. *All questions are compulsory. However, two internal choices in 02 Questions of 5 marks, 02 Questions of 3 marks and 02 Questions of 2 marks have been provided. An internal choice has been provided in the 2 marks questions of Section E.*
8. *Draw neat figures wherever required.*

SECTION-A

(Section-A consists of 20 questions of 1 mark each)

1. The decimal expansion of the number $3\sqrt{2}$ is
(a) a finite decimal (b) 1.41421
(c) non-terminating recurring (d) non-terminating non-recurring

2. The value of $\sqrt{5}$ times $\sqrt{12}$ lies between which two natural numbers?
(a) 8 & 9 (b) 5 & 6 (c) 6 & 7 (d) 7 & 8

3. Which of the following is equal to x?
(a) $\sqrt[12]{(x^4)^{\frac{1}{3}}}$ (b) $\left(\sqrt{x^3}\right)^{\frac{2}{3}}$ (c) $x^{\frac{12}{7}} \times x^{\frac{7}{12}}$ (d) $x^{\frac{12}{7}} - x^{\frac{5}{7}}$

4. The product $(x^2-1)(x^4+x^2+1)$ is equal to

(a) x^8-1 (b) x^8+1 (c) x^6-1 (d) x^6+1

5. If a linear equation has solutions (–2, 2), (0, 0) and (2, – 2), then it is of the form

(a) y – x = 0 (b)–x + 2y = 0 (c) –2x + y = 0 (d) x + y = 0

6. The solution of the linear equation $x+2y=8$ which represents a point on x- axis, is

(a) (4,0) (b) (0,4) (c) (8,0) (d) (4,2)

7. The point of the form (a, a) always lies

(a) on x-axis (b) on y- axis

(c) on the line $y=x$ (d) on the line $x+y=0$

8. A pyramid is a solid figure, the base of which is

(a) only a square (b) only a triangle

(c) only a rectangle (d) any polygon

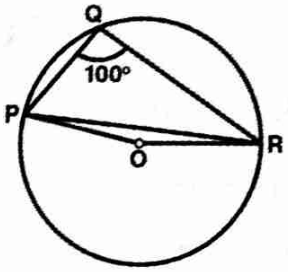
9. The dimensions of the earthen bricks used in the Indus Valley Civilization are in the ratio of

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

10. In the given figure, the value of angle ∠OPR is

(a)20^0 (b) 15^0

(c) 12^0 (d) 10^0

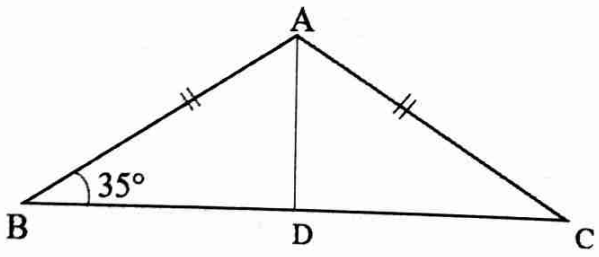


11. It is given that ΔABC ≅ Δ FDE and $\overline{AB}$ = 5 cm, ∠B = 40° and ∠A = 80°. Then which of the following is true?

(a) DF = 5 cm, ∠F = 60° (b) DF = 5 cm, ∠E = 60°

(c) DE = 5 cm, ∠E = 60° (d) DE = 5 cm, ∠D = 40°

12. ΔABC is an isosceles triangle such that $AB=AC$ and AD is the median of the base BC. Then $\angle DAC$ is



(a) 45° (b) 55° (c) 35° (d) 110°

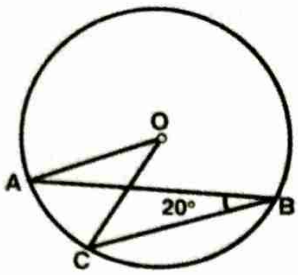
13. If AB = 12 cm, BC = 16 cm and AB is perpendicular to BC, then the radius of the circle passing through the points A, B and C is:

(a) 6 cm (b) 8 cm (c) 10 cm (d) 12 cm

14. Diagonals of a parallelogram ABCD intersect at O. If ∠BOC=90^0 and ∠BDC=50^0, then ∠OAB is:

(a) 90^0 (b) 50^0 (c) 40^0 (d) 10^0

15. In the given figure, if ∠ABC = 20° and O is the centre of the circle, then ∠AOC is equal to:



(a) 10° (b) 20° (c) 40° (d) 60°

16. The length of each side of an equilateral triangle having an area of $9\sqrt{3}$ cm^2 is

(a) 8 cm (b) 36 cm (c) 4 cm (d) 6 cm

17. If the radius of a hemisphere is $2r$ then its volume will be

(a) $\frac{4}{3}\pi r^3$ (b) $\frac{16}{3}\pi r^3$ (c) $\frac{8}{3}\pi r^3$ (d) $\frac{32}{3}\pi r^3$

18. A cone and a hemisphere have equal bases and equal volumes. The ratio of their heights is

(a)1:2 (b) 2:1 (c) 4:1 (d) $\sqrt{2}$:1

19. **Assertion**: If x+7 is a factor of f(x)= $x^2 + 11x - 2a$, then a=-14.

Reason: If x+a is a factor of a polynomial f(x), then f(a)=0.

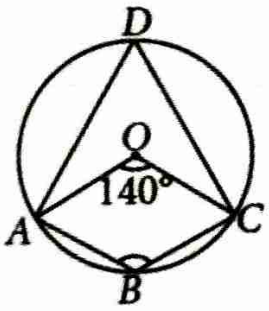
(a) Both assertion (A)and reason (R) are true and reason (R) is the correct explanation of assertion(A).

(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.

20. **Assertion**: In the given figure, O is the centre of circle. If ∠AOC = 140°, then ∠ABC =110°.



Reason: In cyclic quadrilateral, opposite angles are supplementary.

(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.

SECTION-B

Section-B consists of 5 questions of 2 marks each.

21. Insert a rational number and an irrational number between $\sqrt{5}$and $\sqrt{7}$.

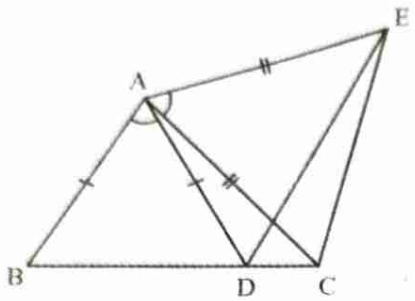
OR

Express $2.\overline{135}$ in the form $\frac{p}{q}$, where p and $q$are integers and $q \neq 0$.

22. Find the value of m so that 2x-1 be a factor of $8x^4+4x^3-16x^2+10x+m$.

23. Determine the point on the graph of the linear equation $2x + 5y = 19$, whose ordinate is $1\frac{1}{2}$ times its abscissa.

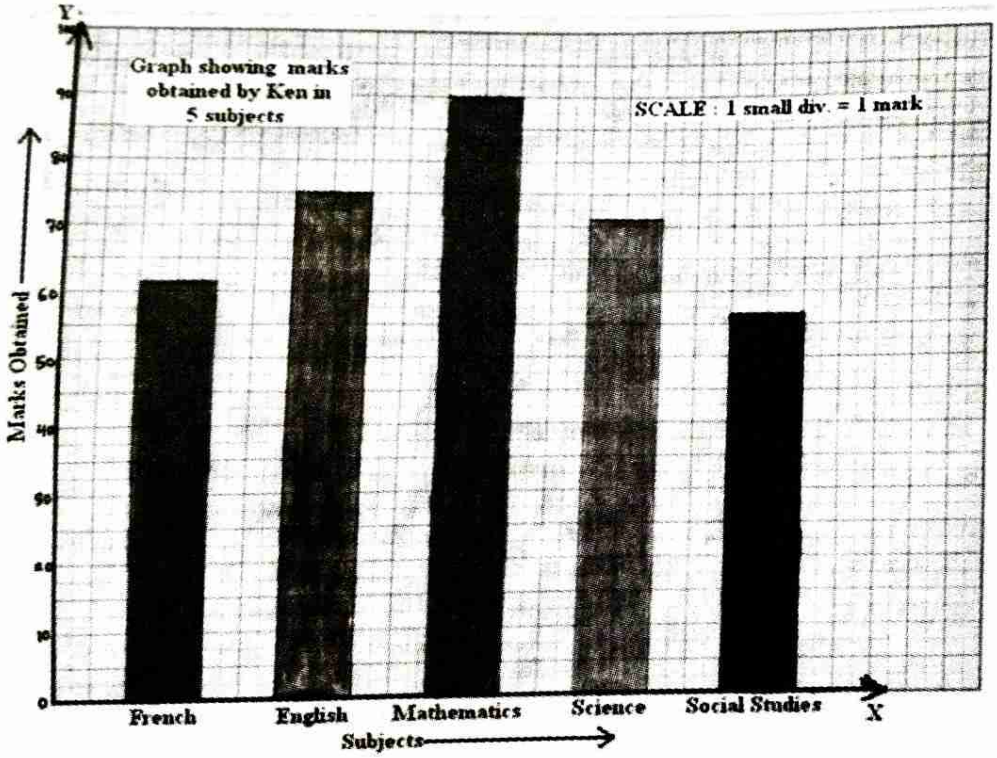
24. In the given figure, AC = AE, AB = AD and ∠BAD = ∠EAC. Show that BC = DE.



OR

AD is an altitude of an isosceles triangle ABC in which AB = AC. Show that
(i) AD bisects BC (ii) AD bisects ∠A.

25. The given bar graph indicates the marks secured by Ken in 5 different subjects. The maximum mark for each subject is 90. By reading the graph, find the percentage mark secured in English and Mathematics.



SECTION-C

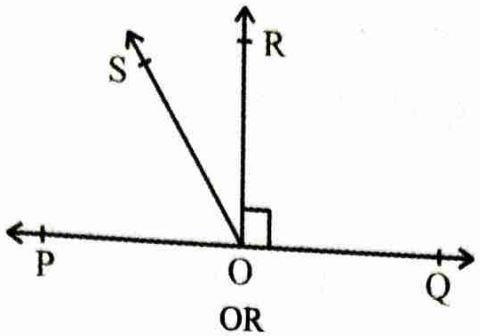
Section-C consists of 6 questions of 3 marks each.

26. If both $x - 2$ and $x - \frac{1}{2}$ are factors of $px^2 + 5x + r$, show that $p = r$.

27. In countries like USA and Canada, the temperature is measured in Fahrenheit, whereas in countries like India, it is measured in Celsius. Here is a linear equation that converts Fahrenheit to Celsius: $F = \frac{9C}{5} + 32$.

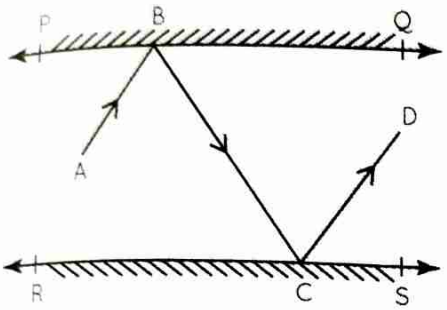
(i)If the temperature is 30°C, what is the temperature in Fahrenheit?
(ii) If the temperature is 95°F, what is the temperature in Celsius?

28. In the given figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that ∠ROS = ½ (∠QOS – ∠POS).



OR

In the given figure, PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that AB || CD.



29. E is the mid-point of a median AD of ΔABC and BE is produced to meet AC at F. Show that AF = $\frac{1}{3}$AC.

30. The sides of a triangular plot are in the ratio 3:5:7 and its perimeter is 300m. Find its area.

31. The radius and slant height of a cone are in the ratio of 4:7. If its curved surface area is 792 cm^2. Then find its radius.

OR

The radius of a sphere is increased by 10%. Prove that the volume will be increased by 33.1% approximately.

SECTION-D

Section-D consists of 4 questions of 5 marks each.

32. If $a = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ & $b = \frac{\sqrt{2}-1}{\sqrt{2}+1}$ find the value of $a^2 + b^2 - 4ab$.

33. Using factor theorem, factorise the polynomial, $x^3 - 23x^2 + 142x - 120$.

OR

If $x^2 + \frac{1}{x^2} = 66$, find $x^3 - \frac{1}{x^3} - 27$

34. ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that

(i) D is the mid-point of AC

(ii) MD ⊥ AC

(iii) CM = MA = ½ AB

35. Two chords AB & CD of lengths 5cm & 11 cm respectively of a circle are parallel to each other and are on the opposite side of its centre. If the distance between AB & CD is 6 cm, then find the radius of the circle.

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, prove that $4q^2 = p^2 + 3r^2$.

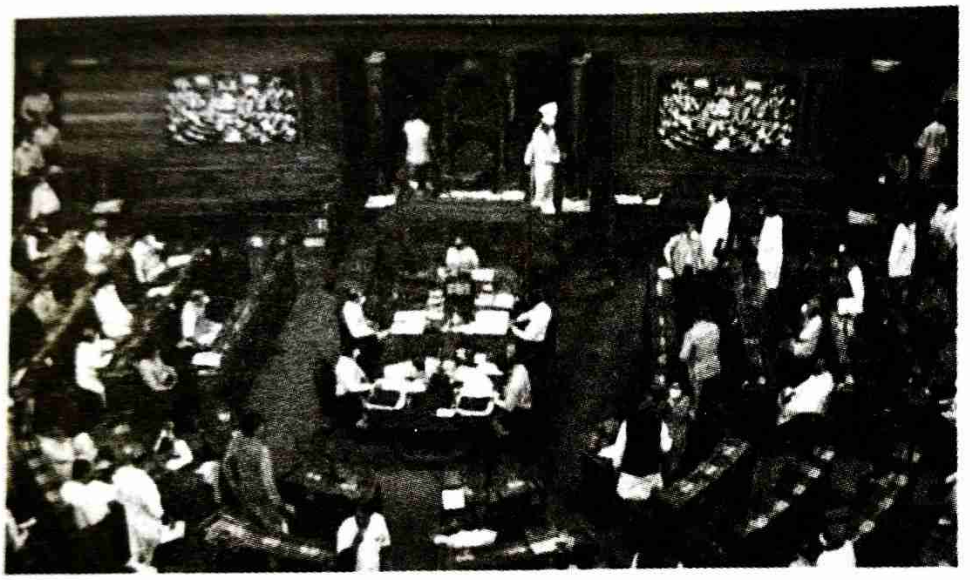
SECTION E

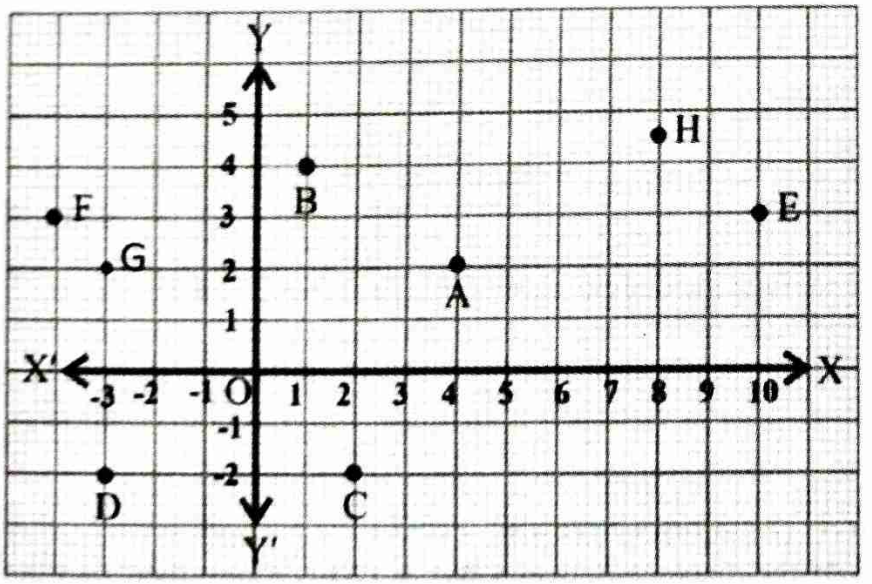
Section-E consists of 3 questions of 4 marks each.

36. **CASE STUDY:**

Student of class IX are on visit of Sansad Bhawan. Teacher assigns them the activity of observe and take some pictures to analyses the seating arrangement between various MP and speaker based on coordinate geometry. The staff tour guide explained various facts related to Math's of Sansad Bhawan to the students, students were surprised when teacher ask them you need to apply coordinate geometry on the seating arrangement of MP's and speaker.

Answer the following questions:





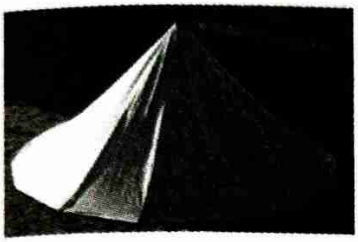
(i)What are the coordinates of point 'G'?
(ii) In which quadrant does the point 'C' lie?
(iii) Find the distance of the point A from point C?

OR

Write the co-ordinates of the points B and D. Also find the sum of the abscissa of the point B and ordinate of the point D.

37. **CASE STUDY:**

The NCC training program was conducted in a Vidyalaya during the last summer break. For their provision, the organising Vidyalaya had made temporary conical shades made of canvas. The radius of the base of tent was 7 m , height of the the tent was 24 m. After performing whole day program of NCC, students came to their tent to take rest. Based on the above information answer the following questions. (use $\pi=\frac{22}{7}$)



(i) Find the slant height of the conical tent.

(ii) Find the area occupied by the tent on the ground.

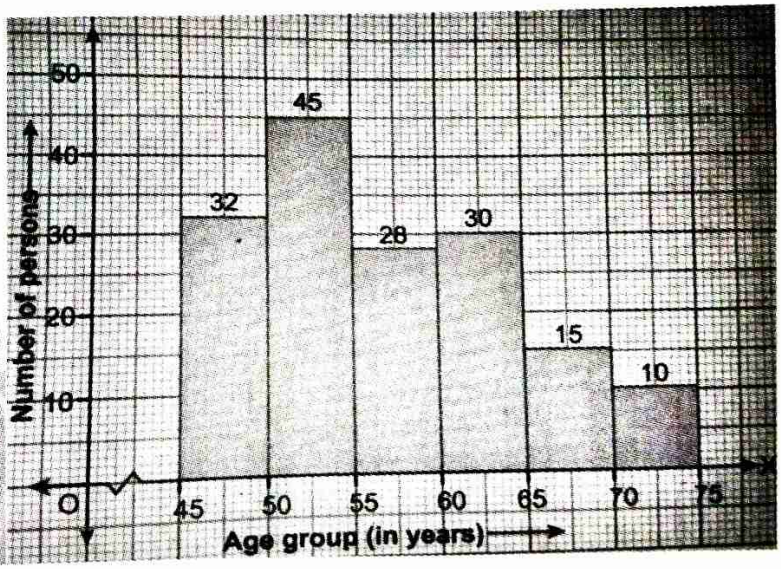
(iii) Find the cost of canvas used to make the tent at a rate of ₹100 per m^2.

Or

Find the volume of air inside the tent if the students inside the tent occupied a space of 700 m^3.

38. **CASE STUDY:**

The histogram here shows the number of persons in various age groups who are vaccinated in a private hospital during a particular day.



(i)Which two age groups have 47 number of people altogether?

(ii) What is the class size taken here?

(iii) How many persons above 60 years of age were given vaccination?

OR

How many more persons were vaccinated in the age group 50-55 as compared to 70-75?

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