Roll No.

SET NO- 1

Candidates must write the Set No. on the title page of the answer book.

DAV PUBLIC SCHOOLS, ODISHA ZONE
PERIODIC ASSESSMENT-II (2023-24)

- Please check that this question paper contains 5 printed pages.
- Set number given on the right-hand side of the question paper should be written on the title page of the answer book by the candidate.
- 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 cooling 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
MATHEMATICS (041)

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

General Instructions:

- This Question Paper has 5 Sections A-E.
- Section **A** has 20 MCQs carrying 1 mark each.
- Section **B** has 5 questions carrying 02 marks each.
- Section **C** has 6 questions carrying 03 marks each.
- Section **D** has 4 questions carrying 05 marks each.
- 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.
- All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2Questions of 2 marks has been provided.
- An internal choice has been provided in the 2marks questions of Section E
- Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

SECTION A

Section A consists of 20 questions of 1 mark each.

1. The value of 3.999…. in the form of p/q where p and q are integers and $q \neq 0$ is
   (a) 2999/1000 (b) 19/10 (c) 4 (d) 26/9
2. The rationalizing factor of $\sqrt[3]{16}$
   (a) $\sqrt[3]{2}$ (b) $\sqrt[3]{3}$ (c) $\sqrt[3]{4}$ (d) $\sqrt[3]{16}$
3. $\frac{\sqrt{112}-\sqrt{80}}{\sqrt{20}-\sqrt{28}}$ is equal to
   (a) $\sqrt{2}$ (b) 2 (c) 4 (d) -2
4. One of the zeroes of the polynomial $3y^2 - y - 2$ is
   (a) -1 (b) 1 (c) 0 (d) does not exist.
5. One of the factors of $(x+y)^3-(x^3+y^3)$ is
   (a) x^2+y^2+2xy (b) x^2+y^2-xy (c) xy^2 (d) 3xy
6. The perpendicular distance of the point $(3,-4)$ from X-axis is:
   (a) 3 units (b) -4 units (c) 4 units (d) 7 units

7. The point P and Q has coordinates $(-2,7)$ and $(-5,9)$ respectively, then the value of (abscissa of P) - (abscissa of Q) is

(a) 3 (b) -3 (c) -2 (d) 2

8. Euclid stated that all right angles are equal to each other in the form of:

(a) An axiom (b) a definition (c) a postulate (d) a proof

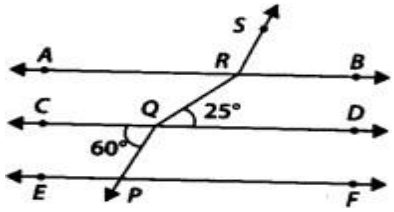
9. The first known proof that 'the circle is bisected by its diameter' was given by

(a) Pythagoras (b) Thales (c) Euclid (d) None of these

10. Find the incorrect statement from the following:

a) A line segment has definite length
b) Three lines are concurrent if and only if they have a common point
c) Two lines drawn in a plane always intersects at a point
d) One and only one line can be drawn passing through a given point and parallel to the given line.

11. In the given figure, if AB || CD || EF, PQ || RS, ∠RQD = 25° and ∠CQP = 60°, then ∠QRS isequal to

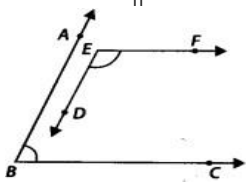


(a) 85^0 (b) 135^0 (c) 145^0 (d) 110^0

12. The ratio between two complementary angles is 2:3, then the angles are

(a) 144°, 216° (b) 120°, 240° (c) 36°, 54° (d) 30°, 60°

13. In the given figure, BA || ED and BC || EF find ∠ABC + ∠DEF



(a) 180^0 (b) 90^0 (c) 270^0 (d) 360^0

14. If ΔABC≅ΔPQR and ΔABC is not congruent to ΔRPQ, then which of the following is not true?

(a) BC = PQ (b) AC = PR (c) AB = PQ (d) QR = BC

15. The quadrilateral formed by joining the mid points of the sides of quadrilateral ABCD, taken in order is a rhombus if

(a) ABCD is a rhombus (b) ABCD is a parallelogram
(c) ABCD is a rectangle. (d) Diagonal of ABCD are perpendicular

16. ABCD is a rhombus such that $\angle ACB = 40°, then \angle ADBis$

(a) 40° (b) 50° (c) 40° (d) 25°

17. If the area of an equilateral triangle is $81\sqrt{3}$ cm^2, find its perimeter.

(a) 18 cm (b) 54 cm (c) 108 cm (d) None of these

18. If the class marks of the class intervals are: 47,52,57and 62, then the second-class interval is

(a) 45-49 (b) 55.5-60.5 (c) 49.5-54.5 (d) 54.5-59.5

19. **Assertion(A):** $t^6 + 4\sqrt{t}$ is a polynomial with degree 6.
Reason(R): $p(x) = x^5$ has degree 5.

(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.

20. **Assertion(A):** If the diagonals of a parallelogram ABCD are equal, then$\angle$ ABC= 90^0
Reason(R): If the diagonals of a quadrilateral are equal, it becomes a rectangle.
(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.

SECTION -B

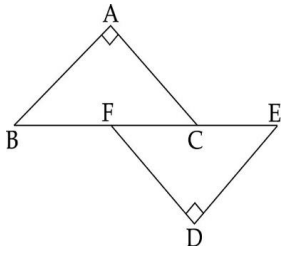
Section B consists of 5 questions of 2 marks each.

21. Factorise: $x^3+8y^3 + 1 – 6xy$

OR

Factorise: $x^3 + y^3 + x + y$

22. A point lies on the x-axis at a distance of 7 units from the y-axis. What are its coordinates? What will be the coordinates if it lies on y-axis at a distance of 7 units from x-axis?
23. In the given figure BA ⊥ AC, DE ⊥ DF Such that BA=DE and BF=EC. Show that ΔABC≅ΔDEF



24. Prove that each angle of a rectangle is a right angle.
25. If each side of an equilateral triangle is increased by 100%, then calculate the percentage of increase in area of the triangle.

OR

Find the area of an isosceles triangle, if the perimeter is 11cm and base is 5cm.

SECTION -C

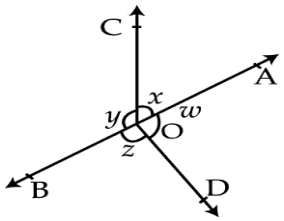
Section C consists of 6 questions of 3 marks each.

26. Simplify: $\frac{\sqrt{5}-\sqrt{3}}{\sqrt{80}+\sqrt{48}-\sqrt{27}-\sqrt{45}}$

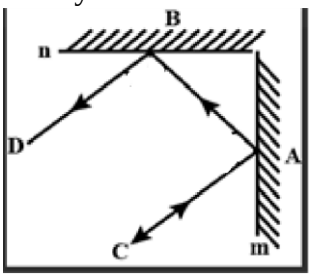
OR

If $\mathbf{a} = \frac{3+\sqrt{5}}{2}$, then find the value of $\mathbf{a}^2 + \frac{1}{\mathbf{a}^2}$

27. In the figure, if x+ y = *w* + *z*, then prove that AOB is a straight line.



28. In the given figure m and n are two plane mirrors perpendicular to each other. Show that incidentray CA is parallel to the reflected ray BD.



29. If the bisector of an angle of a triangle bisects the opposite side, prove that the triangle is isosceles.

OR

Prove that angles opposite to equal sides of an isosceles triangle are equal.

30. The length of the sides of a triangle are 7cm, 13cm and 12cm. Find the longest altitude of the triangle.

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

SECTION D

Section D consists of 4 questions of 5 marks each.

32. Factorise : $x^3 - 23x^2 + 142x - 120$.

33. If $x = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $y = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$, then find the value of $x^2 - xy + y^2$

OR

Simplify : $\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}} - \frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}} - \frac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}}$

34. Show that bisectors of interior angles of a parallelogram forms a rectangle.

OR

E and F are respectively the midpoints of the non-parallel sides AD and BC of a trapezium ABCD. Prove that EF ∥ AB and EF = $\frac{1}{2}$ (AB + CD) .

35. Following table shows a frequency distribution for the speed of cars passing through a particularspot on a high way.

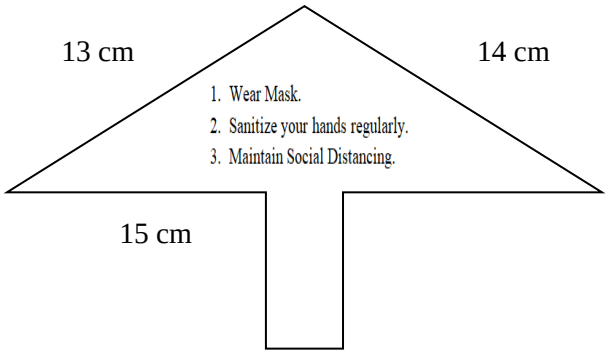
Class interval (km/h)	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	30	60	25	65	50	28	14

Draw a histogram and a frequency polygon representing the above data.

SECTION E

Section E consists of 3 questions of 4 marks each.

36. Covid-19 is the short form of "Corona virus disease 2019", the name of disaster caused by the SARS-CoV-2 corona virus. It has spread so rapidly in many countries that World Health Organisation declared it a pandemic. Various State Governments tried hard measures to fight with this disease and for this several programs were initiated by Delhi Government. One of which was placing hoardings on roadsides all over the city on which some Covid appropriate behaviors and guidelines were written. These hoardings were in the shape of triangle with sides 13 cm, 14 cm and15 cm.



(i) Find the area of a triangular hoarding. (1)

(ii) Find the ratio of perimeter to area of the triangle. (1)

(iii) Find the height of the triangle corresponding to the side 15 cm. (2)

OR

(iii) Find the cost of decorating the border of the triangular hoarding at the rate of Rs 7 per cm.

37. One day, Academic Audit Team of a particular school visited the classroom. Maths teacher was teaching the concept of polynomials to the students. To check if the students understood

the concept taught by her or not, the Team members asked various questions to students. Some of them are given below. Answer them.

(i) Give example of a mathematical expression which is not a polynomial? (1)

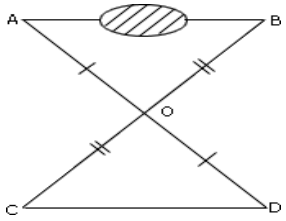
(ii) If $p(x) = x^2 - 4x + 3$, find $p(2) - p(-1)$ (1)

(iii) Find the value of $x^3 + y^3 - 12xy + 64$, when $x + y = -4$ (2)

OR

(iii) Check whether p(x) is a multiple of g(x) or not, where $p(x) = x^3 - x + 1$, $g(x) = 2 - 3x$

38. Susmit wishes to determine the distance between two objects A and B. But there is an obstacle between these two objects (as shown in the figure) which prevents him from making a direct measurement. He thinks to avoid this difficulty. First, he fixes a pole at a convenient point O, so that from O both A and B are visible. Then he fixes another pole at the point D on the line AO (produced)such that AO = DO. In a similar way, he fixes a third pole at the point C on the line BO(produced) such that BO = CO. Then he measured CD as 80 cm.



(i) Write the name of the congruent triangles in the given figure and also state the congruency criterion applicable here. (1)

(ii) In the given figure, if $\angle OCD = 65^0$ and $\angle ODC = 60^0$, find the value of $\angle AOB$. (1)

(iii) Find the length of AB. Justify your answer. (2)

OR

(iii) If OA=50cm, OB=60cm find the sum of the perimeter of the triangles AOB and COD.

*****