

**TERM - I EXAMINATION - (2023-2024)**

**CLASS -IX**

**SUBJECT MATHEMATICS**

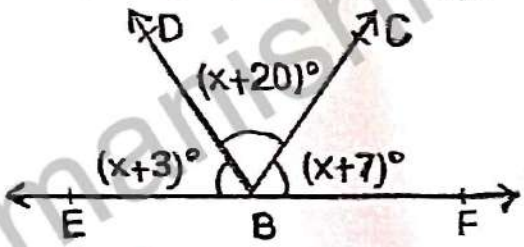
**SET- C**

**TIME DURATION : 3 HRS.**

**MM:80**

**General Instructions:**

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

Q. NO.	SECTION-A (1×20 = 20)	Marks
	Choose the correct options:-	
1	$\sqrt{6} \times \sqrt{27}$ is equal to: (a) $9\sqrt{2}$ (b) $3\sqrt{3}$ (c) $2\sqrt{2}$ (d) $9\sqrt{3}$	1
2	In the given figure, find the value of x:  (a) $40^\circ$ (b) $50^\circ$ (c) $60^\circ$ (d) $80^\circ$	1
3	A solid has how many dimensions? (a) One      (b) Two      (c) Three      (d) Four	1
4	If $x^2 + kx + 6 = (x+2)(x+3)$ for all k, find the value of k. (a) -1      (b) 1      (c) 3      (d) 5	1
5	The decimal representation of the rational number is (a) Always terminating      (b) Either terminating or repeating (c) Either terminating or non-repeating      (d) Neither terminating nonrepeating	1

6	Which of the following is not a criterion for congruence of triangles? (a) SAS (b) ASA <input checked="" type="checkbox"/> (c) SSA (d) SSS	
7	The sides of a triangle are in a ratio of 25:14:12 and its perimeter is 510 m. The greatest side of the triangle is: (a) 270 m <input checked="" type="checkbox"/> (b) 250 m (c) 170 m (d) 120 m	1
8	When the sum of squares of two sides of a triangle is equal to the square of the length of the third side, then it is called a: (a) Scalene triangle (b) Right triangle <input checked="" type="checkbox"/> (c) Isosceles triangle (d) Equilateral triangle	1
9	If $3 + 5 - 8 = 0$ , then the value of $(3)^3 + (5)^3 - (8)^3$ is (a) 260 <input checked="" type="checkbox"/> (b) -360 (c) -160 (d) 160	1
10	The perpendicular distance of the point P (4,3) from x-axis is: (a) 4 (b) 5 <input checked="" type="checkbox"/> (c) 3 (d) none of these	1
11	Which of the following is an axiom? (a) Theorems (b) Definitions <input checked="" type="checkbox"/> (c) The universal truth in all branches of Mathematics (d) Universal truth specific to geometry	1
12	The mirror of a point (3, 4) on y-axis is: (a) (3, 4) <input checked="" type="checkbox"/> (b) (-3, 4) (c) (3, -4) (d) (-3, -4)	1
13	A rational number between $\frac{1}{7}$ and $\frac{2}{7}$ is (a) $\frac{1}{14}$ (b) $\frac{2}{21}$ (c) $\frac{5}{14}$ <input checked="" type="checkbox"/> (d) $\frac{5}{21}$	1
14	If two complementary angles are in the ratio 13 : 5, then the angles are: (a) $18^\circ$ , $52^\circ$ (b) $25^\circ$ , $65^\circ$ <input checked="" type="checkbox"/> (c) $65^\circ$ , $25^\circ$ (d) $65^\circ$ , $35^\circ$	1
15	What is the length of each side of an equilateral triangle having an area of $4\sqrt{3} \text{ cm}^2$ ? <input checked="" type="checkbox"/> (a) 4cm (b) 5cm (c) 10cm (d) 8cm	1
16	It is known that if $x + y = 10$ then $x + y + z = 10 + z$ . Euclid's axiom that illustrates this statement is (a) First Axiom (b) Second Axiom <input checked="" type="checkbox"/> (c) Third axiom (d) Fourth Axiom	1
17	The value of $p(t) = 2+t+2t^2-t^3$ when $t=0$ is <input checked="" type="checkbox"/> (a) 2 (b) 1 (c) 4 (d) 0	1
18	What is the measure of an angle whose measure is $32^\circ$ less than its supplement? <input checked="" type="checkbox"/> (a) $148^\circ$ (b) $60^\circ$ (c) $74^\circ$ (d) $55^\circ$	1



**DIRECTION:-** In the question number 19 & 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.

19

**Assertion:** The degree of the polynomial  $(x^2 - 2)(x - 3)(x + 4)$  is 3.

**Reason:** A polynomial of degree 3 is called a cubic polynomial. (d)

1

20

**Assertion:** The abscissa of a point (5, 2) is 5.

**Reason:** The perpendicular distance of a point from y-axis is called its abscissa (b)

1

### SECTION-B (2 X 5 = 10)

21

Using suitable identity, evaluate  $(999)^3$

OR

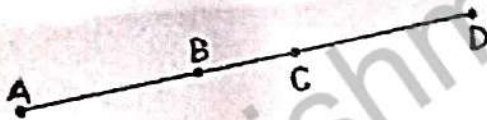
Factorise :

$$16x^2 + 4y^2 + 9z^2 - 16xy - 12yz + 24xz$$

2

22

In the given figure, if  $AC = BD$ , then prove that  $AB = CD$ .



2

23

Find the area of an isosceles triangle with two equal sides as 5 cm each and the third side as 8 cm.

2

24

Represent  $\sqrt{9.3}$  on the number line.

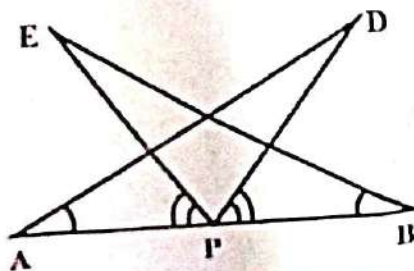
OR

Locate  $\sqrt{3}$  on the number line.

2

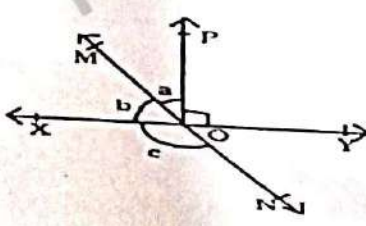
25

AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that  $\angle BAD = \angle ABE$  and  $\angle EPA = \angle DPB$ . Show that  $\triangle DAP \cong \triangle EBP$



2

**SECTION-C**  
(3x 6=18)

26	Express 0.12333... in the form $\frac{p}{q}$ , where p and q are integers and $q \neq 0$ .	3
27	Find the coordinates of the point (i) Which lies on x and y axes both. (ii) Whose ordinate is - 4 and which lies on y-axis. (iii) whose abscissa is 5 and which lies on x-axis	3
28	If $x + y = 12$ and $xy = 27$ , find the value of $x^3 + y^3$ .  OR  If $a + b + c = 15$ and $a^2 + b^2 + c^2 = 83$ , find the value of $a^3 + b^3 + c^3 - 3abc$ .	3
29	$\triangle ABC$ is an isosceles triangle in which $AB = AC$ . Side BA is produced to D such that $AD = AB$ . Show that $\angle BCD$ is a right angle.  OR  Line l is the bisector of an angle $\angle A$ and B is any point on l. BP and BQ are perpendiculars from B to the arms of $\angle A$ . Show that: (i) $\triangle APB \cong \triangle AQB$ (ii) $BP = BQ$ or B is equidistant from the arms of $\angle A$ .	3
30	In the Figure, lines XY and MN intersect at O. If $\angle POY = 90^\circ$ and $a : b = 2 : 3$ , find c.  	3
31	The sides of a triangle are 11 m, 60 m and 61 m. What is the altitude to the smallest side?  - 25.5	3



**SECTION-D**  
(5×4=20)

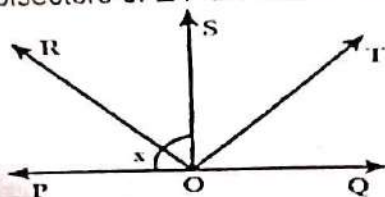
- 32 If  $x = \frac{2-\sqrt{5}}{2+\sqrt{5}}$  and  $y = \frac{2+\sqrt{5}}{2-\sqrt{5}}$ , find the value of  $x^2 - y^2$ . 5  
OR

(a) Find the Value of  $(256)^{0.16} \times (256)^{0.09}$  2

(b) Find the value of  $\left(\frac{4}{216^{\frac{-2}{3}}} + \frac{1}{256^{\frac{-3}{4}}} + \frac{2}{243^{\frac{-1}{5}}}\right)$  3

- 33 If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel. 5  
OR

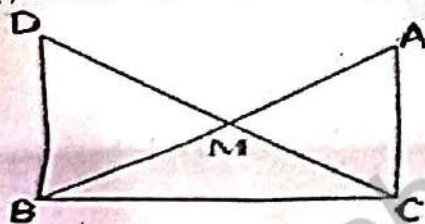
In the given figure, ray OS stands on a line POQ. Ray OR and ray OT are angle bisectors of  $\angle POS$  and  $\angle SOQ$ , respectively. If  $\angle POS = x$ , find  $\angle ROT$ .



- 34 In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that  $DM = CM$ . Point D is joined to point B (see Fig.). Show that: 3+2

(i)  $\triangle AMC \cong \triangle BMD$

(ii)  $\angle DBC$  is a right angle

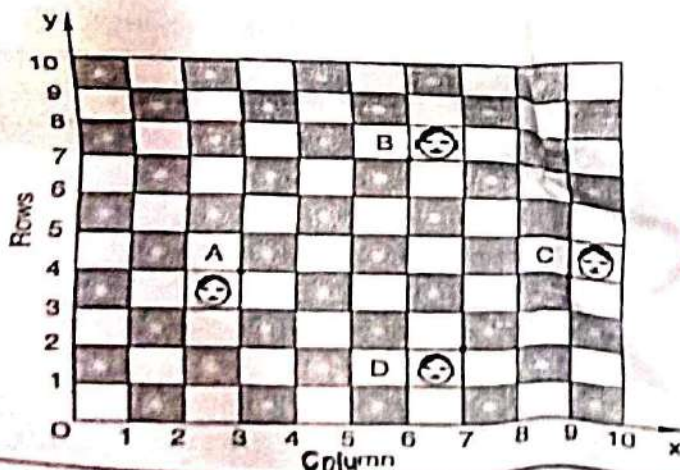


- 35 If both  $x - 2$  and  $x - \frac{1}{2}$  are factors of  $px^2 + 5x + r$ , show that  $p = r$ . 5

**SECTION-E**  
(4 X 3 =12)

Case study questions:

- 36 Four persons John, Saurabh, Salim and Ratan are sitting in a courtyard at points A, B, C and D respectively as shown in figure.



The courtyard has been divided into small squares by drawing equally spaced horizontal and vertical lines. Taking OX and OY as the coordinate axes answer the following questions:

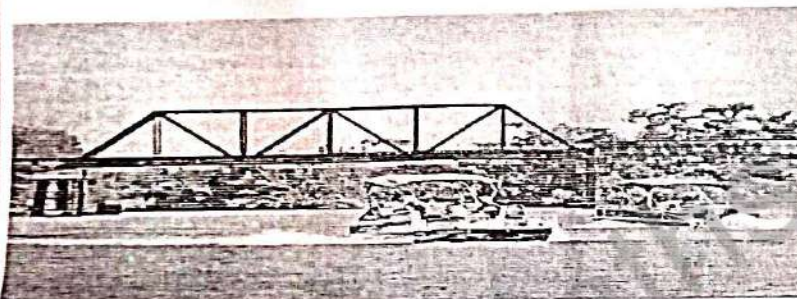
- 1) Find the coordinate of Saurabh.
- 2) Find the distance between John and Salim.
- 3) Find the difference of ordinate of Salim and abscissa of Saurabh.

OR

Find the distance between John and Saurabh.

37

**Direction:** Isosceles triangles were used to construct a bridge in which the base(unequal side) of an isosceles triangle is 4 m and its perimeter is 20 m



- (a) What is the length of equal sides?  $2\sqrt{5}$
- (b) What is perimeter of triangle?  $20\text{m}$
- (c) Find the area of triangle?  $4\sqrt{5}\text{m}^2$

OR

If the sides of triangle in the ratio 3: 5: 7 and perimeter is 300 m then find its area.

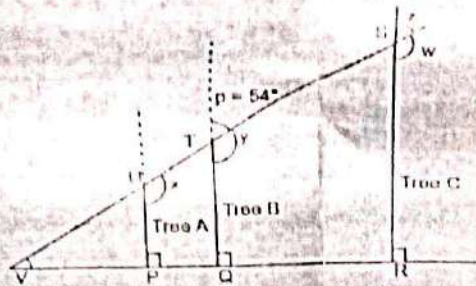
38

Shown below is the picture of tree A that had broken in a storm and its broken part is leaning on two neighbouring trees(standing erect) B & C.

The broken part of tree A leans on the major stem of the tree B at an angle of  $P = 54^\circ$

The diagram of the picture is drawn alongside showing angles x,y,z and w being formed and the marked points P, Q, R, S, T, U and V.





- I) What is the measurement of angle  $y$ ?  $126^\circ$
- II) What is the value of  $x$ ?  $126^\circ$
- III) What is the ratio of measurement of  $Z$  &  $Y$   $3:2$   
Or
- IV) What is the ratio of measurement of  $x$  &  $Y$

1  
1  
2  
2