INDIAN SCHOOL AL WADI AL KABIR

Mid Term Examination (2024-25)

Class: IX | Sub: MATHEMATICS | Max Marks: 80

Date:24/9/2024 | SET-1 | Time:3 hours

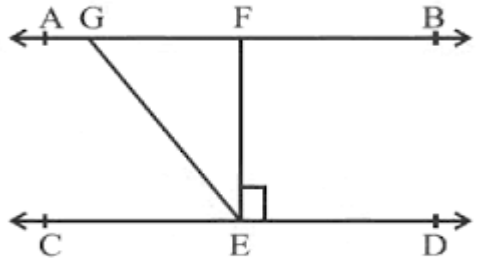
General Instructions:

1. This question paper has 5 sections- A, B, C, D and E.
2. Section A - PART-1 (MCQ) comprises of 18 questions of 1 mark each
3. Section A - PART-2 (Assertion and Reason) comprises of 2 questions of 1 mark each.
4. Section B - (Short answer) comprises of 5 questions of 2 mark each.
5. Section C - (Long answer) comprises of 6 questions of 3 marks each.
6. Section D - (Long answer) comprises of 4 questions of 5 marks each.
7. Section E - comprises of 3 Case study-based questions of 4 marks each with sub parts of the values 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice has been provided for certain questions.

Section A

PART-1 MCQ (1 mark each)

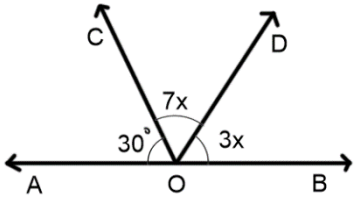
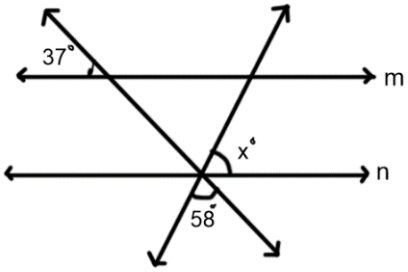
Q. 1. If AB || CD, EF ⊥ CD and ∠GED = 145° as per the figure given below. The value of ∠FGE is:



	A	125°	**B**	140°	**C**	90°	**D**	35°

Q. 2. The simplest rationalizing factor of $\frac{1}{\sqrt{98}}$ is

	A	$\sqrt{2}$	**B**	$\sqrt{7}$	**C**	$\frac{7}{\sqrt{2}}$	**D**	$\frac{2}{\sqrt{7}}$

Q. 3.	In a frequency distribution, the mid value of a class is 15 and the class size is 4. The lower limit of the class is						
	A	10	**B**	12	**C**	13	**D**	14
Q. 4.	In the given figure, AOB is a straight line, then, the value of x is: 						
	A	30°	**B**	34°	**C**	17°	**D**	15°
Q. 5.	The points (3, -5) and (-5, 3) lie in _____respectively.						
	A	I and III quadrant	**B**	IV and II quadrant	**C**	II and III quadrant	**D**	II and IV quadrant
Q. 6.	Euclid stated that all right angles are equal to each other in the form of						
	A	a definition	**B**	an axiom	**C**	a proof	**D**	a postulate
Q. 7.	In the figure, if m‖n, then the value of x is 						
	A	90°	**B**	85°	**C**	75°	**D**	70°
Q.8.	The co-ordinates of a point whose ordinate is 6 and which lies on y-axis is:						
	A	(0, 6)	**B**	(0, -6)	**C**	(6, 0)	**D**	(-6, 0)
Q. 9.	The base of a right triangle is 6 cm and hypotenuse is 10 cm. Its area is:						
	A	30 cm^2	**B**	40 cm^2	**C**	24 cm^2	**D**	48 cm^2
Q. 10.	In ΔABC and ΔDEF, AB = DE, $\angle A = \angle D$. The two triangles will be congruent by SAS congruence if						
	A	BC=EF	**B**	BC=DF	**C**	AC=EF	**D**	AC=DF

Q.11. In order to draw a histogram which is represented by the following frequency distribution, the adjusted frequency for the class 25 – 45 is:

Class interval	0 - 5	5 - 10	10 - 20	20 - 25	25 - 45
Frequency	8	12	7	23	20

A 20 **B** 15 **C** 10 **D** 5

Q.12. The value of $\left[\left((81)^{\frac{-1}{2}}\right)^{\frac{-1}{4}}\right]^2$ is

A 3 **B** $\frac{1}{3}$ **C** 9 **D** $\frac{1}{9}$

Q.13. If $(a + 7, -7) = (9, b + 2)$, then the value of a and b respectively are:

A $2, -9$ **B** $9, -7$ **C** $-7, 9$ **D** $2, -7$

Q.14. If the area of an equilateral triangle is$16\sqrt{3}\ cm^2$, then its perimeter is:

A 48 cm **B** 24 cm **C** 8 cm **D** 36 cm

Q.15. If each of the two equal sides of an isosceles right triangle is 10 cm long, then its area is

A $50cm^2$ **B** $5\sqrt{10}\ cm^2$ **C** $100\ cm^2$ **D** $5\sqrt{2}cm^2$

Q.16. The class mark of the class 85-90 is

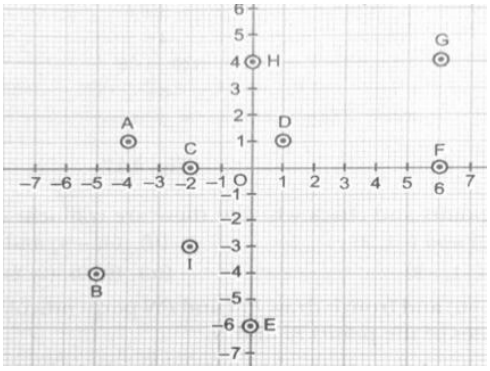
A 85.5 **B** 90.5 **C** 87.5 **D** 97.5

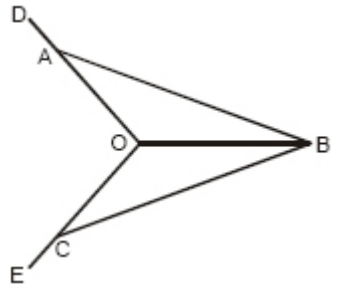
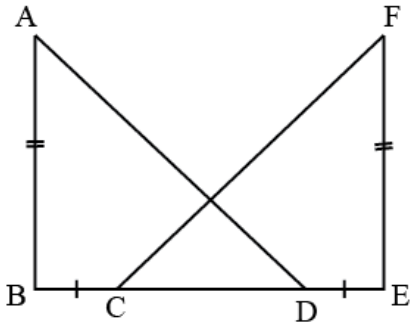
Q.17. Euclid divided his famous treatise "The Elements" into:

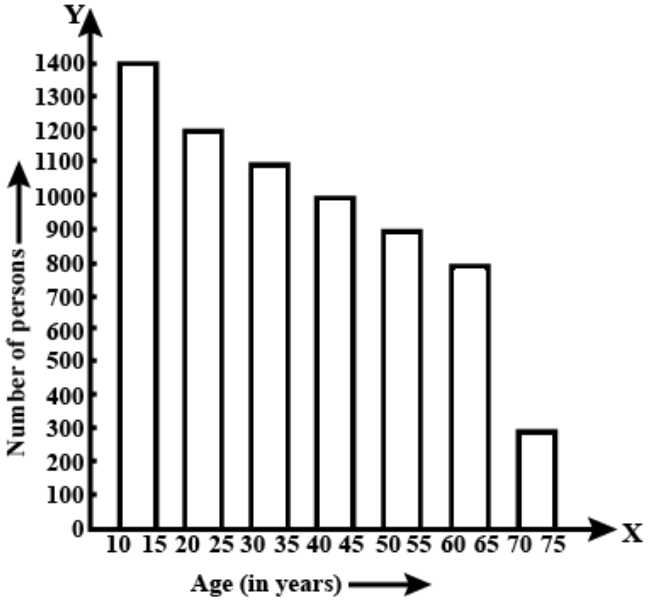
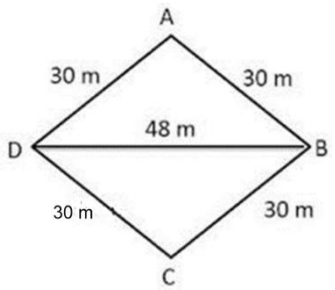
A 13 chapters **B** 12 chapters **C** 11 chapters **D** 10 chapters

Q. 18. A rational number between -3 and 3 is

A 0 **B** -4.3 **C** -3.4 **D** 1.101100110001…

	PART-2 ASSERTION AND REASON (1 mark each)
	DIRECTION: A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option from the following. 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.
Q.19	Statement A (Assertion): The area of an equilateral triangle with side 2 cm is $\sqrt{3}\ cm^2$. Statement R (Reason): If the side of an equilateral triangle is 'a' unit, then area of an equilateral triangle is $\frac{\sqrt{3}a^2}{4}$ sq. units.
Q.20	Statement A (Assertion): The rationalizing factor of $3\sqrt{2} - 2\sqrt{3}$ is $3\sqrt{3} - 2\sqrt{3}$ Statement R (Reason): If the product of two irrational numbers is rational, then each one is called the rationalizing factor of the other.
	Section B Short answer questions (2 mark each)
Q. 21.	Ramesh and Rutuja have the same weight. If they each gain weight by 2 kg, how will their new weights be compared? State the axiom used.
Q.22.	Based on the below given figure, answer the following questions: a) Coordinates of the point F. b) Write any one pair of points whose abscissas are equal. c) The perpendicular distance of the point D from the x-axis. d) Ordinate of the point C. 

Q.23.	In the given figure, AB = BC and OB bisects ∠ABC, then prove that OA=OC. 
Q.24.	Represent $\sqrt{8.5}$ on a number line. Or Simplify: $3\sqrt{45} - \sqrt{125} - \sqrt{50}$
Q.25.	The sides of a triangle are in the ratio 25:17:12 and its perimeter is 540 m. Find the area of the triangle.
	Section C Short Answer questions (3 mark each)
Q.26.	State any three Euclid's axioms.
Q.27.	Express $0.6 + 0.\overline{7} + 0.4\overline{7}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$. Or Simplify by rationalizing the denominator $\frac{7+3\sqrt{5}}{3+\sqrt{5}} + \frac{7-3\sqrt{5}}{3-\sqrt{5}}$
Q.28.	In the given figure, AB = FE, BC = ED, AB ⊥ BD, FE ⊥ EC. Prove that ΔABD ≅ ΔFEC 

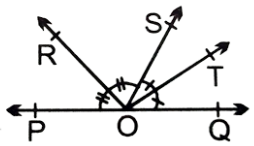
Q.29.	Study the bar graph representing the number of persons age groups in a town. Observe the bar graph and answer the following questions:  i) What is the total population of the town? ii) How many persons are more in the age group 10 – 15 than in the age group 30 – 35? iii) What is the ratio of the number of persons in the age group 70-75 to that of the age group 50-55?
Q.30.	The lengths of the sides of a triangle are 7 cm, 13 cm and 12 cm. Find the area of the triangle. Also find the length of perpendicular from the opposite vertex to the side whose length is 12 cm. Or A rhombus shaped field has green grass for 18 cows to graze. If each side of the rhombus is 30 m and its longer diagonal is 48 m, how much area of grass field will each cow be grazing? 

Q.31.

Prove that if two lines intersect each other, then the vertically opposite angles are equal.

Or

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



Section D

Long answer questions (5 mark each)

Q. 32.

If $\frac{2+\sqrt{3}}{2-\sqrt{3}}+\frac{2-\sqrt{3}}{2+\sqrt{3}}+\frac{\sqrt{3}-1}{\sqrt{3}+1}=a+b\sqrt{3}$, find the values of a and b.

Or

Evaluate: $\frac{4}{(216)^{\frac{-2}{3}}}-\frac{5}{(256)^{\frac{-3}{4}}}+\frac{2}{(243)^{\frac{-1}{5}}}$

Q. 33.

Plot the points A $(-3, 2)$, B $(-7, -3)$, C $(6, -3)$, D $(2,2)$ in a graph paper. Join the points A, B, C and D in order. Also write the name of the figure so obtained.

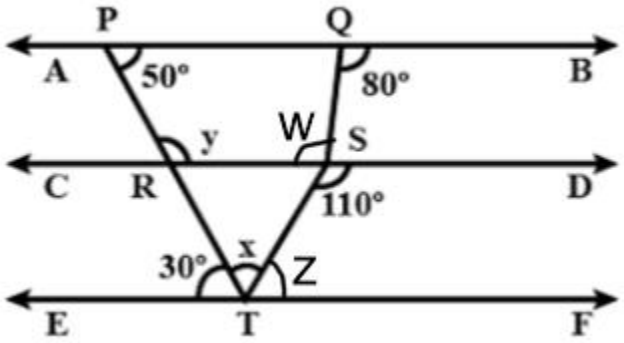
Q. 34.

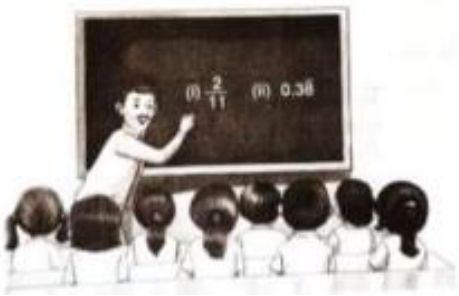
Construct a histogram with a frequency polygon on the same graph from the following distribution of total marks obtained by 55 students of class IX in the final examination.

Marks	140 - 150	150 - 160	160 - 170	170 - 180	180 - 190	190 - 200
Number of students	8	10	15	12	7	3

Q.35.

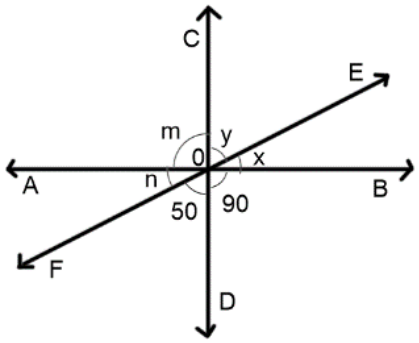
In the given figure, AB∥CD, CD∥EF. Find the value of x, y, z and w.



	Section E **CASE STUDY BASED QUESTIONS(4 mark each)**
Q.36.	**CASE STUDY-I** To judge the preparation of students of class IX on the Topic 'Number System', Mathematics teacher writes numbers on the board as shown in the figure. He asks some questions related to the topic. Based on the above information, answer the following question:  i) Write the decimal form of $\frac{5}{8}$ and state if it is terminating or non terminating. (1) ii) Divide $4\sqrt{21} \div 2\sqrt{3}$ (1) iii) a) If $x = \frac{\sqrt{7}+\sqrt{6}}{\sqrt{7}-\sqrt{6}}$, then find the value of $\left(x + \frac{1}{x}\right)^2$. (2) Or b) Find two irrational numbers between $\frac{1}{5}$ and $\frac{3}{4}$ (2)
Q.37.	**CASE STUDY-II:** Teacher's Day is a special occasion celebrated to honour and appreciate the dedication and contributions of teachers in shaping the future of students. Students decorated the Multipurpose hall using triangular flags. Each flag has dimensions 41 cm, 28 cm and 15 cm respectively.  i) What will be the semi-perimeter of a flag having the above-mentioned dimensions? (1) ii) Find the area of cloth required for making one flag. (1) iii) a) If the rate of the cloth is ₹ 2 per cm^2, find the total cost of 300 flags. (2) Or b) The perimeter of an isosceles triangle is 40 cm. The ratio of the equal side to its base is 3:4. Find the area of the triangle.

Q.38. **CASE STUDY-III**

Handloom Haat fair was organised in a housing complex to motivate upcomming youngsters to give them an hands on experience on textile buisness. Geesh was an expert in hand embroidery and decieded to display her work during the fair. She used intersecting lines to prepare the beautiful design in table cloth, bedcover etc.



Geesh found that three straight lines AB, CD and EF intersect each other at O and

$\angle BOD = 90°$, $\angle DOF = 50°$.

Based on the above information answer the following question:

i) Find the value of m. (1)

ii) Find the value of x. (1)

iii) a) Find the value of reflex $\angle COE$. (2)

Or

b) In the figure given PQ and RS intersect each other at a point O. If $\angle POR : \angle ROQ = 4:5$, find $\angle POS$ and $\angle SOQ$. (2)