INDIAN SCHOOL AL WADI AL KABIR

Mid-Term Examination (2023-24)

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

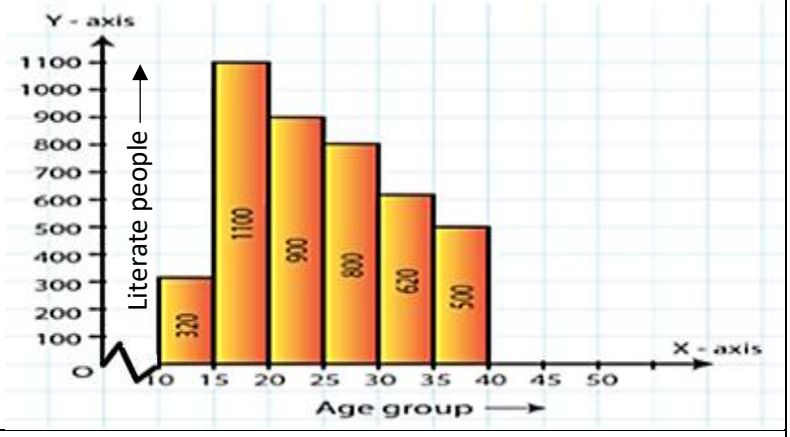
Date: 01/10/23 | Set - 2 | Time: 2 ½ hours

Instructions:

Section A: Multiple Choice Question (Q.1 to Q.15) & Source-based Question (Q.16)
Section B: Short Answer Questions of 2 marks each (Q.17 to Q.21)
Section C: Long Answer Questions (Type – 1) of 3 marks each (Q.22 to Q.26)
Section D: Long Answer Questions (Type – 2) of 4 marks each (Q.27 to Q.31)
& Case study Question (Q.32 to Q.34) of 5 marks each.

Section A: Multiple Choice Question (Q.1 to Q.15) of **1** mark each								
1.	Express the thickness of the soap bubble 0.00001275m in the standard form.							
	A	1.275×10^{-5}m	**B**	1.275×10^{-7}m	**C**	12.75×10^{-5}m	**D**	1.275×10^{5}m
2.	What is the multiplicative inverse of $(19)^{-5}$?							
	A	$\left(\frac{-1}{19}\right)^{5}$	**B**	$\frac{1}{19}$	**C**	$(-19)^{-5}$	**D**	$(19)^{5}$
3.	In the class interval (35 – 45), 45 is called as the____.							
	A	Upper limit	**B**	Lower limit	**C**	Range	**D**	Frequency
4.	Simplify: $(-2)^{7} \div (-2)^{3}$ and express the result in power notation with a positive exponent.							
	A	$(-2)^{3}$	**B**	$(-2)^{4}$	**C**	$(2)^{3}$	**D**	$(-2)^{-10}$
5.	What is the measure of the sum of all interior angles of a convex polygon with seven sides?							
	A	180°	**B**	540°	**C**	630°	**D**	900°

6.	Which of the following rational numbers lies between $\frac{-1}{2}$ and $\frac{1}{3}$?							
	A	$\frac{2}{6}$	**B**	$\frac{-1}{6}$	**C**	$\frac{3}{6}$	**D**	$\frac{-5}{3}$
7.	Prime factorization of a perfect square number, N is given below. Which set of numbers should be in the place of A and B respectively? $N = 2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 7 \times 11 \times 11 \times 13 \times A \times B$							
	A	7 and 13	**B**	7 and 2	**C**	3 and 11	**D**	10 and 12
8.	Name the property of the rational numbers illustrated by the mathematical expression $\frac{5}{11} \times \left(\frac{2}{7} + \frac{-3}{7}\right) = \left(\frac{5}{11} \times \frac{-3}{7}\right) + \left(\frac{5}{11} \times \frac{2}{7}\right)$							
	A	Commutativity	**B**	Associativity	**C**	Identity	**D**	Distributivity
9.	The number of pencils in Kitty's box is 6 more than twice the number of rulers in it. If the number of pencils in her box is P and the number of rulers is R, which of the following is true?							
	A	6R = P	**B**	P + 6 =2R	**C**	2R + 6 = P	**D**	6P = R
10.	Choose the Rational number equivalent to $\frac{-2}{5}$.							
	A	$\frac{2}{10}$	**B**	$\frac{2}{5}$	**C**	$\frac{-20}{50}$	**D**	$\frac{-12}{15}$
11.	What will be the unit digit of the square root of the 4489?							
	A	1,9	**B**	3,7	**C**	3,9	**D**	1,7
12.	Find the measure of an exterior angle of a regular polygon of 6 sides.							
	A	90°	**B**	60°	**C**	50°	**D**	75°

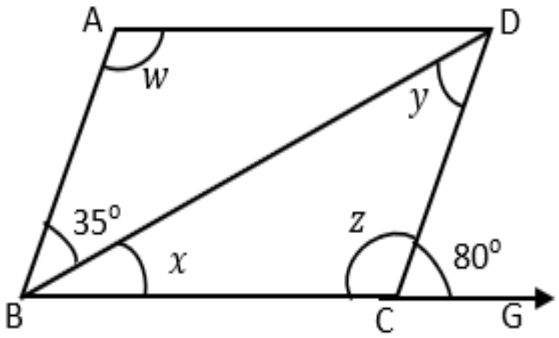
13.	Simplify: $\sqrt{24+\sqrt{144}}$						
	A	$\sqrt{30}$	**B**	6	**C**	$\sqrt{306}$	**D**	$\sqrt{168}$
14.	How many consecutive odd numbers starting from 1, have to be added to get 64?						
	A	8	**B**	5	**C**	2	**D**	10
15.	Which of these describes a trapezium?						
	A	The diagonals are equal.	**B**	The diagonals bisect each other	**C**	The diagonals are perpendicular	**D**	A pair of opposite sides is parallel
Q16.	**Source-based Question -5 Marks** The following histogram shows the literate population in a particular town of the age group of 10 to 40 years:  						
I	Write the age group in which the number of literate people is the highest.						
	A	15 - 20	**B**	20 - 25	**C**	25 - 30	**D**	30 - 35
II	What is the class width of each group?						
	A	10	**B**	5	**C**	15	**D**	25
III	What is the frequency in the age group 30 - 35?						
	A	1100	**B**	800	**C**	620	**D**	320
IV	In which age group the literate people are the least?						
	A	15 - 20	**B**	10 - 15	**C**	25 - 30	**D**	30 - 35
V	Find the total literate population above the age of 20 years?						
	A	1980	**B**	1820	**C**	2820	**D**	4440

Section B: Short Answer Questions (Type – 1) of **2** marks each (Q.17 to Q.21)	
17.	Find the value of $\left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{5}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$
18.	Calculate the missing value of "x" in the following expression: $\left(\frac{1}{9}\right)^{2} \times \left(\frac{1}{9}\right)^{3x} = \left(\frac{1}{9}\right)^{17}$
19.	Find a Pythagorean triplet whose smallest member is 10.
20.	The sum of two-fifths of a number and 46 is 110. Find the number.
21.	By using appropriate property, Find the value of: $\frac{3}{8} \times \frac{-4}{5} + \frac{3}{8} \times \frac{9}{5}$.
Section C: Long Answer Questions (Type – 1) of **3** marks each (Q.22 to Q.26)	
22.	Simplify: $\frac{4^{-3} \times a^{-5} \times b^{-4}}{4^{-5} \times a^{-8} \times b^{3}} \quad (a, b \neq 0)$
23.	Solve the linear equation and find the value of variable x: $8x + 4 = 3(x - 1) + 17$
24.	Find the square root of 1369 by the Division method.
25.	Represent $\frac{-3}{4}, 0, \frac{1}{4}$, and $\frac{1}{2}$ on the same number line.
26.	In a quadrilateral, the angles A, B, C and D are in the ratio 1 : 2 : 3 : 4. Find the measure of each angle of the quadrilateral.
Section D: Long Answer Questions (Type – 2) (Q.27 to Q.31) of **4** marks each & Case study (Q.32 to Q.34) of **5** marks each	
27.	Insert 4 rational numbers between $\frac{-1}{4}$ and $\frac{1}{5}$.
28.	The present ages of Anu and Raj are in the ratio 4:5. After 5 years their ages will add to 64 years. Find their present ages.
29.	Find the smallest whole number by which 1575 should be multiplied to get a perfect square number, also find the square number so obtained.

30. A school has formed 4 clubs to conduct various co-curricular activities. Students were told they could join the club of their choice. Draw a pie chart for the given information.

Club name	**Number of students**
Math Club	60
Eco Club	45
Drama Club	45
Readers Club	30
Total	**180**

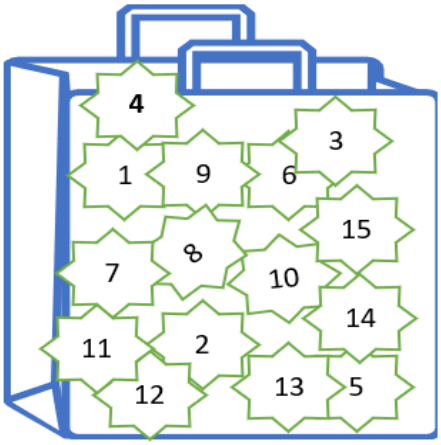
31. In a parallelogram ABCD, sides BC extended to point G. Find values of w, x, y, and z from the given figure.



32. **Case Study-1**

Sally and her friends created a banner in the shape of a parallelogram for an inter-school competition on the topic "SAVE WATER". The banner looks like the figure given below:
Based on the given information answer the following questions:

1. If ∠A = (4x + 30°) and ∠B = 70° + x. Find the measure of 'x'.
2. If AB = 2y – 3 and CD = 5cm, then what is the value of 'y'?
3. Name the special parallelogram with equal four sides and equal angles.

33.	**Case Study-2** For the Children's Day special assembly, Class VII and Class VIII, together consisting of 912 students, had to be seated in the multipurpose hall in such a way that there were equal numbers of students in each row as there were rows in the hall. However, some children were left without a seat in the MP hall. Based on the given information, answer the following questions:  1. How many students did not get a seat in the MP hall? 2. The Students were holding right-angled triangle shaped flags with sides of 6 cm and 8 cm. Find length of the longest side of the flag. 3. How many natural numbers lie between $(18)^2$ and $(19)^2$?
34.	**Case Study-3** Students of Class VIII tried to understand the concept of probability, they made 15 cards in which numbers from 1 to 15 are written and put them into a bag. A card is taken out from the bag at random. Based on the given information, answer the following questions:  1. List numbers on selected cards that are divisible by 3. Find probability of the event. 2. List the outcomes and find the probability of getting a prime number smaller than 10. 3. The letters that make up the word MATH are placed in a bowl. What is the probability of selecting the letter "A"?

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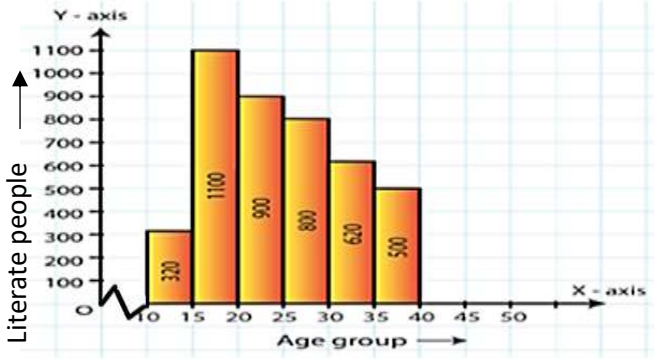
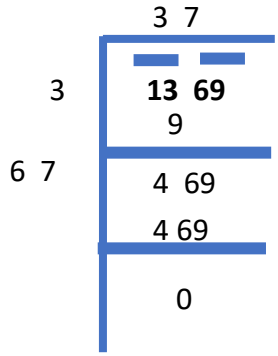
ANSWER KEY								
Section A: Multiple Choice Question (Q.1 to Q.15) of **1** mark each								
1.	Express the thickness of the soap bubble 0.00001275m in the standard form.							
	A	1.275×10^{-5}m						
2.	What is the multiplicative inverse of 19^{-5}?							
							D	19^5
3.	In the class interval (35 – 45), 45 is called as the							
	A	Upper limit						
4.	Simplify: $(-2)^7 \div (-2)^3$ and express the result in power notation with a positive exponent.							
			B	$(-2)^4$				
5.	What is the measure of the sum of all interior angles of a convex polygon with seven sides?							
							D	900°
6.	Which of the following rational numbers lies between $\frac{-1}{2}$ and $\frac{1}{3}$?							
			B	$\frac{-1}{6}$				
7.	Prime factorization of a perfect square number, N is given below. Which set of numbers should be in the place of A and B respectively? N = 2 × 2 × 3 × 3 × 5 × 5 × 7 × 11 × 11 × 13 × A × B							
	A	7 and 13						
8.	Name the property of the rational numbers illustrated by the mathematical expression $\frac{5}{11}\times\left(\frac{2}{7}+\frac{-3}{7}\right)=\left(\frac{5}{11}\times\frac{-3}{7}\right)+\left(\frac{5}{11}\times\frac{2}{7}\right)$							
							D	Distributivity
9.	The number of pencils in Kitty's box is 6 more than twice the number of rulers in it. If the number of pencils in her box is p and the number of rulers is r, which of the following is true?							
					C	2r + 6 = p		
10.	Choose the rational number equivalent to $\frac{-2}{5}$.							
					C	$\frac{-20}{50}$		
11.	What can possibly be the unit digit of the square root of the 4489?							
			B	3 or 7				
12.	Find the measure of an exterior angle of a regular polygon of 6 sides.							
			B	60°				

13.	Simplify: $\sqrt{24+\sqrt{144}}$							
			B	6				
14.	How many consecutive odd numbers starting from 1, have to be added to get 64?							
	A	8						
15.	Which of these describes a trapezium?							
							D	A pair of opposite sides is parallel
Q16.	**Source-based Question -5 Marks** The following histogram shows the literate population in a particular town of the age group of 10 to 40 years:  							
I	Write the age group with the highest number of literate people.							
	A	15 - 20						
II	What is the class width of each group?							
			B	5				
III	What is the frequency in the age group 30 - 35?							
					C	620		
IV	In which age group the literate people are the least?							
			B	10 - 15				
V	Find the total literate population above the age of 20 years?							
					C	2820		
Section B: Short Answer Questions (Type – 1) of **2** marks each (Q.17 to Q.21)								
17.	Find the value of $\left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{5}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$ $(3)^2 + (5)^2 + (4)^2$ ----------1 mark 9 + 25 + 16 =50 ---------- 1 mark							
18.	Calculate the missing value of "x" in the following expression: $\left(\frac{1}{9}\right)^{2} \times \left(\frac{1}{9}\right)^{3x} = \left(\frac{1}{9}\right)^{17}$ Compare powers 2 + 3x = 17 ----------1 mark 3x = 17 – 2 ---------- ½ mark							

	X = 15/3 = 5 ---------- ½ mark
19.	Find a Pythagorean triplet whose smallest member is 10. 2m = 10 m = 10/2 =5 ---------- ½ + ½ mark $m^2 + 1 = 5^2 + 1 = 25 + 1 = 26$ ---------- ½ mark $m^2 - 1 = 5^2 - 1 = 25 - 1 = 24$ ---------- ½ mark
20.	The sum of two-fifths of a number and 46 is 110. Find the number. Let the number be x $\frac{2}{5}x + 46 = 110$ ---------- 1 mark $\frac{2}{5}x = 110$ - 46 = 64 ---------- ½ mark $x = 64 \times \frac{5}{2}$ = 160 ---------- ½ mark
21.	By using appropriate property, Find the value of: $\frac{3}{8} \times \frac{-4}{5} + \frac{3}{8} \times \frac{9}{5}$. $\frac{3}{8} \times (\frac{-4}{5} + \frac{9}{5})$ ---------- 1 mark $\frac{3}{8} \times (\frac{-4+9}{5})$ ½ mark $\frac{3}{8} \times (\frac{5}{5})$ $= \frac{3}{8}$ ½ mark
Section C: Long Answer Questions (Type – 1) of **3** marks each (Q.22 to Q.26)	
22.	Simplify: $\frac{4^{-3} \times a^{-5} \times b^{-4}}{4^{-5} \times a^{-8} \times b^{3}}$ $(a, b \neq 0)$ $4^{-3-(-5)} \times a^{-5-(-8)} \times b^{-4-3}$ ---------- applying 3 laws- 1½ marks $4^{-3+5} \times a^{-5+8} \times b^{-7}$ ½ mark $2^{2\,x\,2} \times a^{3} \times b^{-7}$ ½ mark $(2)^4 \times a^{3} \times b^{-7}$ – – – – – ½ mark
23.	Solve the linear equation and find the value of variable x: $8x + 4 = 3(x - 1) + 17$ $8x + 4 = 3x - 3 + 17$ 1 mark $8x - 3x = 14 - 4$ 1 marks $5x = 10$ ½ mark $x = \frac{10}{5} = 2$ ½ mark

24. Find the square root of 1369 by the Division method.



Grouping in pair ------½ mark
First sq. no 3^2 as 9 ---- ½ mark
Second step --------- ½ mark
Find no. on right of 6 (7) ------ 1 mark
Final ans -------½ mark

25. Represent $\frac{-3}{4}, 0, \frac{1}{4}$, and $\frac{1}{2}$ on the same number line.
Number line ----------1 mark
Each number ½ mark

26. In a quadrilateral, the angles A, B, C and D are in the ratio 1 : 2 : 3 : 4. Find the measure of each angle of the quadrilateral.
x + 2x + 3x + 4x = 360 1 mark
x = 360/10 = 36 ½ mark
2x= 2 x 36= 72, 3x = 3 x 36 = 108 , 4x = 4 x 36 = 144 ------- ½ mark each

Section D: Long Answer Questions (Type – 2) (Q.27 to Q.31) of **4** marks each
& Case study (Q.32 to Q.34) of **5** marks each

27. Insert 4 rational numbers between $\frac{-1}{4}$ and $\frac{1}{5}$.
Finding LCM(4, 5) = 20 ------- 1 mark
Writing equivalent RN $\frac{-5}{20}$ and $\frac{4}{20}$ ---------1 mark
$\frac{-4}{20}, \frac{-3}{20}, \frac{-2}{20}, \frac{-1}{20}$ 0 $\frac{1}{20}, \frac{2}{20}, \frac{3}{20}$ any 4 --------½ mark each

28. The present ages of Anu and Raj are in the ratio 4:5. After 5 years their ages will add to 64 years. Find their present ages.
Let age of Anu

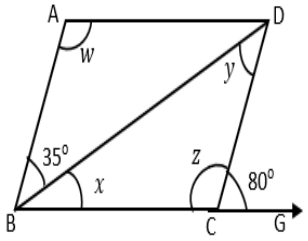
	Present age	Age after 5 years
Anu	4x	4x + 5
Raj	5x	5x + 5

----------1 mark
4x + 5 +5x + 5 = 64 -------- 1 mark
9x = 64- 10 ½ mark
x = 54/9 =6 ½ mark
Anu = 4 x 6 =24, Raj = 5 x 6 = 30 1 mark

29. Find the smallest whole number by which 1575 should be multiplied to get a perfect square number, also find the square number so obtained.
1575 = 5 x 5 x 3 x 3 x 7 ------- 2 ½ mark(each division ½ mark)
Smallest whole number = 7 -------- 1 mark
Square number 11025 --------½ mark

30. A school has formed 4 clubs to conduct various co-curricular activities. Students were told they could

Club name	**Number of students**	**Angles**
Math Club	60	120

	join the club of their choice. Draw a pie chart for the given information. Drawing circle --------1 mark Finding Central angle 1 mark Each sector ½ each	Eco Club	45	90
		Drama Club	45	90
		Readers Club	30	60
		Total	**180**	
31.	In a parallelogram ABCD, sides BC extended to point G. Find values of w, x, y, and z from the given figure. z + 80 = 180 -------LP z = 100-------- 1 mark w = z =100 (opposite angle of parallelogram are equal) ----- 1 mark y =35 (alternate angle) ----------1 mark x + y +z =180(angle sum of triangle) x = 180 -135 = 45 ----------1mark			
32.	**Case Study-1:** Sally and her friends created a banner in the shape of a parallelogram for a inter-school competition on the topic of "SAVE WATER" as shown in the figure: Based on the given information answer the following questions: 1. If ∠A = (4x + 30°) and ∠B = 70° + x. Find the measure e of 'x'. ∠A + ∠B = 180 (adjacent angle of ∥ $gm = 180$) 4x + 30°+ 70° + x = 180° ------ (1 mark) 5x = 180 – 100=80 -------- ½ mark X =80/5 = 16 ½ mark 2. If AB = 2y – 3 and CD = 5cm, then what is the value of 'y'? 2y – 3 = 5(opposite sides are equal ∥ gm)----------1 mark 2y =5 +3 =8 ½ mark = 8/2 = 4 ½ mark 3. Name the special parallelogram with equal four sides and equal angles. Square ----------1 mark			
33.	**Case Study-2** For the Children's Day special assembly, Class VII and Class VIII, together consisting of 912 students, had to be seated in the multipurpose hall in such a way that there were equal numbers of students in each row as there were rows in the hall. However, some children were left without a seat in the MP hall. Based on the given information, answer the following questions: 2. How many students did not get a seat sit in the MP hall? Find sq. root with division method -------1mark Getting reminder as 12 1mark 2. The Students were holding flags which was in the shape of right-angled triangle with sides of 6 cm and 8 cm. Find length of the longest side of the flag.			

	Using Pythagoras theorem. theorem $6^2 + 8^2 = side^2$ 1 mark 36+ 64 = 100 ½ mark Side = 10 cm ½ mark 3. How many natural numbers lie between 18^2 and 19^2? 2x 18 = 36 ----- 1 mark
34.	**Case Study-3** Students of Class VIII tried to understand the concept of probability, they made 15 cards in which numbers from 1 to 15 are written and put them into a bag. A card is taken out from the bag at random. Based on the given information, answer the following questions: 4. List numbers on selected cards that are divisible by 3. Find probability. No divisible by 3 = 3, 6, 9, 12, 15 ------1 mark P= 5/15 = 1/3 ½ + ½ mark 5. List the outcomes and find probability of getting a prime number smaller than 10. Outcomes = 2, 3, 5, 7 ----1 mark P = 4/15 1 mark 6. The letters that make up the word MATH are placed in a bowl. What is the probability of selecting the letter "A"? P= 1/ 4 ---------- 1 mark

***** The end*****