



COMMON FIRST MID-TERM TEST – 2023

Standard IX

Reg.No. :

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MATHEMATICS

Time: 1.30 hrs.

Part - I

Marks: 50

I. Choose the correct answer:

7 x 1 = 7

1. If $B \subseteq A$ then $n(A \cap B)$ is
 - a) $n(A - B)$
 - b) $n(B)$
 - c) $n(B - A)$
 - d) $n(A)$
2. If $n(A) = 10$ and $n(B) = 15$, then the minimum and maximum number of elements in $A \cap B$ is
 - a) 10, 15
 - b) 15, 10
 - c) 10, 0
 - d) 0, 10
3. For any three sets P, Q and R , $P - (Q \cap R)$ is
 - a) $P - (Q \cup R)$
 - b) $(P \cap Q) - R$
 - c) $(P - Q) \cup (P - R)$
 - d) $(P - Q) \cap (P - R)$
4. If $n(A \cup B \cup C) = 100$, $n(A) = 4x$, $n(B) = 6x$, $n(C) = 5x$, $n(A \cap B) = 20$, $n(B \cap C)$, $n(A \cap C) = 25$ and $n(A \cap B \cap C) = 10$, then the value of x is
 - a) 10
 - b) 15
 - c) 25
 - d) 30
5. If n is a natural number then \sqrt{n} is
 - a) always a natural number
 - b) always a rational number
 - c) always an irrational number
 - d) may be rational or irrational
6. Which one of the following is an irrational number?
 - a) $\sqrt{25}$
 - b) $\sqrt{\frac{9}{4}}$
 - c) $\frac{7}{11}$
 - d) π
7. Where do the circumcenter lie in the obtuse triangle?
 - a) inside of triangle
 - b) outside of triangle
 - c) on the triangle
 - d) none of the above

Part - II

II. Answer any five questions.

5 x 2 = 10

8. Represent the following set in Roster form
 - a) $A =$ The set of all even natural numbers less than 20
 - b) $B = \{x : x \in Z, -5 < x \leq 2\}$
9. Find the number of subsets and the number of proper subsets of a set $X = \{a, b, c, x, y, z\}$
10. If $A = \{6, 7, 8, 9\}$ and $B = \{8, 10, 12\}$ find $A \Delta B$
11. If $A = \{a, b, c, e, u\}$ and $B = \{a, e, i, o, u\}$, find $A \cup B$ and $A \cap B$
12. If $n(A) = 25$, $n(B) = 40$, $n(A \cup B) = 50$, find $n(A \cap B)$

(2)

13. Find any two rational numbers between $\frac{1}{2}$ and $\frac{2}{3}$
14. Verify that $1 = 0.\overline{9}$

Part - III

5 x 5 = 25

III. Answer any five questions.

15. Let $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$, $A = \{1, 3, 5, 7\}$ and $B = \{0, 2, 3, 5, 6\}$, find the following sets
 a) A' b) B' c) $A' \cup B'$ d) $A' \cap B'$ e) (A')
16. Verify $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ using Venn diagrams.
17. If $A = \{-2, 0, 1, 3, 5\}$, $B = \{-1, 0, 2, 5, 6\}$ and $C = \{-1, 2, 5, 6, 7\}$, then show that
 $A - (B \cup C) = (A - B) \cap (A - C)$
18. In a group of 100 students, 85 students speak Tamil, 40 students speak English, 20 students speak French, 32 speak Tamil and English, 13 speak English and French and 10 speak Tamil and French. If each student knows atleast any one of these languages, then find the number of students who speak all these three languages.
19. Represent 4.863 on the number line.
20. Find the decimal expansion of $\sqrt{3}$.
21. Convert the following decimal numbers in the form of $\frac{p}{q}$ ($p, q \in \mathbb{Z}$ and $q \neq 0$)
 a) $0.\overline{3}$ b) $2.\overline{124}$

Part - IV

IV. Answer the following question.

1 x 8 = 8

22. a) Construct the circumcenter of the $\triangle ABC$ with $AB = 5$ cm, $\angle A = 60^\circ$ and $\angle B = 80^\circ$. Also draw the circumcircle and find the circumradius of the $\triangle ABC$.

(OR)

- b) Construct the $\triangle LMN$ such that $LM = 7.5$ cm, $MN = 5$ cm, $LN = 8$ cm. Locate its centroid.
