

Student Name:

Date:

SETS AND OPERATIONS ON SETS

I. Multiple Choice Questions

Select and write one most appropriate option out of the four options given for each of the questions 1 – 5.

- If $P =$ Set of counting numbers greater than 6 and $Q =$ Set of counting numbers less than 6, then find $P \cap Q$.
(a) $\{6\}$ (b) $\{0\}$ (c) $\{\}$ (d) None of these
- If $P = \{1, 3, 5, 7\}$ and $Q = \{\text{odd counting numbers less than } 10\}$, what is the relationship between P and Q ?
(a) $P = Q$ (b) $P \subset Q$ (c) $P < Q$ (d) $Q \subset P$
- Two sets which have equal number of elements are known as
(a) Equal sets (b) Equivalent sets
(c) Unequal sets (d) Disjoint sets
- If $U = \{\text{multiples of } 4\}$ and $A = \{\text{multiples of } 4 \text{ and less than } 16\}$, find A' .
(a) $\{\text{multiples of } 4 \text{ greater than and equal to } 16\}$
(b) $\{\text{multiples of } 4\}$
(c) $\{\text{multiples of } 4 \text{ less than } 16\}$
(d) None of these
- If $A = \{1, 2, 3, 4, 5, 6, 7\}$, then find $n(A)$.
(a) 7 (b) 6 (c) 5 (d) 4

II. Fill in the Blank Type Questions

Fill in the blanks with a suitable word for each of the questions 6–10.

6. 12 _____ {prime numbers}
7. 17 _____ {odd prime numbers}
8. Two sets which have no common element(s) are known as _____.
9. A' denote the _____ of A .
10. A set that has no member is called _____.

III. True or False

State whether the following statements are true or false for each of the questions 11–15.

11. The collection of ten most talented writers of Liberia is a set.
12. Sets having exactly the same members are called equal sets.
13. $\{\phi\}$ and $\{0\}$ are empty sets.
14. A unit set is also called singleton set and it is a finite set.
15. If $A = \{x, y, z\}$, then its subsets are:
 $\{\}, \{x\}, \{y\}, \{z\}, \{x, y\}, \{x, z\}, \{y, z\}, \{x, y, z\}$.

IV. Very Short Answer Type Questions

Answer each of the questions 16–20.

16. State which of the following sets are finite or infinite:
 (a) {days of the week} (b) {odd natural numbers}

17. If $X = \{a, b, c\}$, then find its subsets.

18. State as equivalent and equal sets.

$$P = \{7, 9, 11, 15\} \quad \text{and} \quad Q = \{15, 11, 9, 7\}$$

19. If $Q = \{7, 8, 9, 10\}$ and $R = \{5, 6, 7, 8\}$, find $Q \cup R$.

20. If the universal set is $U = \{1, 2, 3, \dots, 10\}$, find A' where $A = \{1, 2, 3, 4, 5\}$.

V. Short Answer Type Questions

Answer each of the questions 21–25.

21. If $X = \{0, 2, 4, 6\}$, $Y = \{2, 4, 8, 16\}$ and universal set $U = \{0, 2, 4, 6, 8, 10, 12, 14, 16\}$, then find $X \cap Y$.

- 22.** Let $A = \{x : x \text{ is a letter of the word PERMANENT}\}$
 and $B = \{x : x \text{ is a letter of the word TEMPORARY}\}$
 Verify that $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

- 23.** State as equivalent and equal sets.
 $M = \{m, a, t, h, e, i, c, s\}$ and $N = \{e, n, g, l, i, s, h\}$

- 24.** Given universal set $U = \{0, 2, 4, 6, 8, 10, \dots, 100\}$, write the complements of each set?
 $\{100, 98, 96, 94, \dots, 50\}$ and $\{0, 2, 4, 6, 8, 10, \dots, 48\}$

25. Is the set C the universal set of sets A and B if
 $A = \{2, 4, 6, 8\}$, $B = \{\text{factors of } 12\}$, $C = \{2, 3, 4, 6, 8, 12\}$? Why?

Teacher's Signature