



PES UNIVERSITY, Bangalore

(Established under Karnataka Act No. 16 of 2013)

Department of Computer Science & Engineering

Automata Formal Languages & Logic

Question Bank - Sets

1) Find the union, intersection and the difference ($A - B$) of the following pairs of sets.

a) A = The set of all letters of the word FEAST

B = The set of all letters of the word TASTE

b) $A = \{x \mid x \in \mathbb{N}, x \text{ is a factor of } 12\}$

$B = \{x \mid x \in \mathbb{N}, x \text{ is a multiple of } 2, x < 12\}$

c) A = The set of all even numbers less than 12

B = The set of all odd numbers less than 11

2) Let $X = \{2, 4, 5, 6\}$ $Y = \{3, 4, 7, 8\}$ $Z = \{5, 6, 7, 8\}$, find

a) $(X - Y) \cup (Y - X)$

b) $(X - Y) \cap (Y - X)$

c) $(Y - Z) \cup (Z - Y)$

3) Find all possible partitions of the set $A = \{a, b, c\}$.

4) If $n(A - B) = 18$, $n(A \cup B) = 70$ and $n(A \cap B) = 25$, then find $n(B)$.

5) In a group of 60 people, 27 like cold drinks and 42 like hot drinks and each person likes at least one of the two drinks. How many like both coffee and tea?

6) Let $A = \{2, 3, 4, 5, 6, 7\}$ $B = \{2, 4, 7, 8\}$ $C = \{2, 4\}$. Fill in the blanks by \subset or $\not\subset$ to make the resulting statements true.

a) $B _ A$

b) $C _ A$

c) $B _ C$

d) $\emptyset _ B$



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7) State whether true or false.

- a) Quadrilateral \subseteq polygon
- b) Whole numbers \subseteq natural numbers
- c) $\{a\} \in \{d, e, f, a\}$
- d) Natural numbers \subseteq whole numbers
- e) Integers \subseteq natural numbers

8) Write down all the possible proper subsets for each of the following.

- a) $\{a, b, c, d\}$
- b) $\{1, 2, 3\}$
- c) $\{x\}$
- d) \emptyset

9) Let $A = \{x : x = n - 2, n < 5\}$. Find A when W is a whole number, N is a natural number, Z is an integer

- a) $n \in W$
- b) $n \in N$
- c) $n \in Z$

10) What are the resulting sets of the following.

- a) $\{1, 2, 3\} \cap \{1, 2\}$
- b) $\{1, 2, 3\} \cap \{R, G, B\}$
- c) $\{1, 2, 3\} \cap \emptyset$
- d) $\{1, 2, 3\} \cup \{1, 4\}$
- e) $\{1, 2, 3\} \cup \{R, G, B\}$
- f) $\{1, 2, 3\} \cup \emptyset$