

### Exercise Set

1) Let  $A = \{1, 2, 4, a, b, c\}$ . Which statement is TRUE?

- A)  $3 \in A$
- B)  $2 \in A$
- C)  $c \notin A$
- D)  $\{\} \notin A$
- E)  $\emptyset \in A$
- F)  $A \in A$

Correct Answer: B ,D

2) Let  $A = \{x \mid x \text{ is a real number and } x < 6\}$ . Which statement is TRUE?

- A)  $3 \in A$
- B)  $6 \in A$
- C)  $-8 \in A$
- D)  $5 \notin A$
- E)  $8 \notin A$
- F)  $3.4 \notin A$

Correct Answer: A, C, E

3) In each ,give the set of letters in each word :

- A) AARDVARK;:
- B) BOOK
- C) MISSISSIPPI

Correct Answer: A : ARDVK , B: BOK , MISP

4) In each part ,give the set by listing its elements

- A) {the set of all positive integer that are less than ten
- B)  $\{x \mid x \in \mathbb{Z} \text{ and } x^2 < 12\}$

Correct Answer: A  $\{1,2,3,4,5,6,7,8,9\}$

B =  $\{-3,-2,-1,0,1,2,3\}$

5) In each part ,write the set in the form  $\{x \mid p(x)\}$  , where  $p(x)$  is a property that describe the element of the set

- A)  $\{2,4,6,8,10\}$
- B)  $\{a,e,i,o,u\}$
- C)  $\{1,8,27, 64, 125\}$
- D)  $\{-2,-1,0,1,2\}$

Correct Answer: A:  $\{x:x \in \mathbb{Z}^+ \text{ and } x \text{ is even and } x \leq 10\}$

B :  $\{x:x \text{ is a vowel in english }\}$

C :  $\{x:x \in n^3, \text{for } n = 1,2,3,4,5\}$

D: :

$\{x:x \in \mathbb{Z} \text{ and } -2 \leq x \leq 2\}$

6) Let  $A = \{1,2,3,4,5\}$ . Which set equals A?

- A)  $\{4,1,2,3,5\}$
- B)  $\{1,2,3\}$
- C)  $\{1,2,3,4,6\}$
- D)  $\{x \mid x^2 \leq 25\}$

Correct Answer: A

7) Which set is empty?

- A)  $\{x \mid x \text{ is a real number } x^2 - 1 = 0\}$
- B)  $\{x \mid x \text{ is a real number } x^2 + 1 = 0\}$
- C)  $\{x \mid x \text{ is a real number } x^2 = -9\}$

Correct Answer: B,C

8) Number of subsets of  $\{a,b\}$  is:

- A) 2
- B) 3
- C) 4

- D) 5

Correct Answer: C

9) Number of subsets of  $\{\}$  is:

- A) 0
- B) 1
- C) 2
- D) infinite

Correct Answer: B

10) If  $A = \{1,2,5,8,11\}$ , which is TRUE?

- A)  $\{5,1\} \subseteq A$
- B)  $\{1,2,5,8,11\} \subseteq A$
- C)  $\{1,6\} \not\subseteq A$
- D)  $\{3\} \not\subseteq A$
- E)  $\{8,1\} \in A$
- F)  $A \subseteq \{11,2, 5, 1,6,4\}$

Correct Answer: A, B, C D,

### Exercise Set Operations

1) In exercises 1 through 4, let  $U = \{a, b, c, d, e, f, g, h, k\}$

$$A = \{a, b, c, g\}$$

$$B = \{d, e, f, g\}$$

$$C = \{a, c, f\}$$

$$D = \{f, h, k\}$$

1. compute

- $A \cup B = \{a, b, c, g, d, e, f\}$
- $B \cup C = \{d, e, f, g, a, c\}$
- $A \cap C = \{a, c\}$
- $B \cap D = \{f\}$
- $A - B = \{a, b, c\}$

- f.  $\bar{A} = \{d, e, f, h, k\}$
- g.  $A \oplus B = \{a, b, c\} \cup \{d, e, f\}$
- h.  $A \oplus C = \{b, g\} \cup \{f\}$

2. compute

- a.  $A \cup D = \{a, b, c, g, f, h, k\}$
- b.  $B \cup D = \{d, e, f, g, h, k\}$
- c.  $C \cap D = \{f\}$
- d.  $A \cap D = \emptyset$
- e.  $B - C = \{d, e, g\}$
- f.  $\bar{B} = \{a, b, c, h, k\}$
- g.  $C - B = \{a, c\}$
- h.  $C \oplus D = \{a, c\} \cup \{h, k\}$

3. compute

- a.  $A \cup B \cup C = \{a, b, c, g, d, e, f\}$
- b.  $A \cap B \cap C = \{\}$
- c.  $A \cap (B \cup C) = \{a, b, c, g\} \cap \{d, e, f, g, a, c\} = \{a, g, c\}$
- d.  $(A \cup B) \cap C =$

2) Let U be the set of real number , $A = \{x \mid x \text{ is a solution of } x^2 - 1 = 0\}$  and  $B = \{-1, 4\}$  compute

- a.  $\bar{A} = \mathbb{R} \setminus \{-1, 1\}$
- b.  $\bar{B} = \mathbb{R} \setminus \{-1, 4\}$

### Exercise sequence

1) Find the first four terms of the sequence

$$a_n = 3n + 1$$

Sol:

$$n = 1, 2, 3, 4$$

$$\text{For } n = 1: a_1 = 3(1) + 1 = 4$$

$$\text{For } n = 2: a_2 = 3(2) + 1 = 7$$

$$\text{For } n = 3: a_3 = 3(3) + 1 = 10$$

For  $n=4$ :  $a_4 = 3(4) + 1 = 13$

Sequence :{4,7,10,13}

2) Find the first four terms of the sequence

$$a_n = 10 - 2n$$

$$n=1,2,3,4$$

For  $n=1$ :  $a_1 = 10 - 2(1) = 8$

For  $n=2$ :  $a_2 = 10 - 2(2) = 6$

For  $n=3$ :  $a_3 = 10 - 2(3) = 4$

For  $n=4$ :  $a_4 = 10 - 2(4) = 2$

Sequence :{8,6,4,2}