

# SETS

- 1) Identify and write the “common property” of the following collections.
  - 1) 2,4,6,8,...
  - 2) 2,3,5,7,11,...
  - 3) 1,4,9,16,...
  - 4) January, February, March, April,...
  - 5) Thumb, index finger, middle finger, ring finger, pinky
- 2) Write the following sets
  - 1) Set of the first five positive integers.
  - 2) Set of multiples of 5 which are more than 100 and less than 125
  - 3) Set of first five cubic numbers.
  - 4) Set of digits in the Ramanujan number
- 3) List the elements of the following sets.
  - (i)  $G = \{\text{all the factors of } 20\}$
  - (ii)  $F = \{\text{the multiples of } 4 \text{ between } 17 \text{ and } 61 \text{ which are divisible by } 7\}$
  - (iii)  $S = \{x : x \text{ is a letter in the word 'MADAM'}\}$
  - (iv)  $P = \{x : x \text{ is a whole number between } 3.5 \text{ and } 6.7\}$
- 4) Write the following sets in the roster form.
  - (i) B is the set of all months in a year having 30 days.
  - (ii) P is the set of all prime numbers smaller than 10.
  - (iii) X is the set of the colours of the rainbow
- 5) A is the set of factors of 12. Which one of the following is not a member of A.  
(A) 1 (B) 4 (C) 5 (D) 12
- 6) Write some sets of your choice, involving algebraic and geometrical ideas.
- 7) Match roster forms with the set builder form.
  - (i)  $\{p, r, i, n, c, a, l\}$  (a)  $\{x : x \text{ is a positive integer and is a divisor of } 18\}$
  - (ii)  $\{0\}$  (b)  $\{x : x \text{ is an integer and } x^2 - 9 = 0\}$
  - (iii)  $\{1, 2, 3, 6, 9, 18\}$  (c)  $\{x : x \text{ is an integer and } x + 1 = 1\}$
  - (iv)  $\{3, -3\}$  (d)  $\{x : x \text{ is a letter of the word PRINCIPAL}\}$
- 8) Express the following statements using symbols.
  - (i) The element 'x' does not belong to 'A'.
  - (ii) 'd' is an element of the set 'B'.
  - (iii) '1' belongs to the set of Natural numbers.
  - (iv) '8' does not belong to the set of prime numbers P.
- 10) Write the following sets in roster form.
  - (i)  $B = \{x : x \text{ is a natural number smaller than } 6\}$
  - (ii)  $C = \{x : x \text{ is a two-digit natural number such that the sum of its digits is } 8\}$ .
  - (iii)  $D = \{x : x \text{ is a prime number which is a divisor of } 60\}$ .
  - (iv)  $E = \{x : x \text{ is an alphabet in BETTER}\}$ .

- 11) Write the following sets in the set-builder form.
- (i)  $\{3, 6, 9, 12\}$                       (ii)  $\{2, 4, 8, 16, 32\}$   
 (iii)  $\{5, 25, 125, 625\}$               (iv)  $\{1, 4, 9, 16, 25, \dots, 100\}$
- 12) Write the following sets in roster form.
- (i)  $A = \{x : x \text{ is a natural number greater than 50 but smaller than 100}\}$   
 (ii)  $B = \{x : x \text{ is an integer, } x^2 = 4\}$   
 (iii)  $D = \{x : x \text{ is a letter in the word "LOYAL"}\}$
- 13) Match the roster form with set builder form.
- (i)  $\{1, 2, 3, 6\}$  (a)  $\{x : x \text{ is prime number and a divisor of 6}\}$   
 (ii)  $\{2, 3\}$  (b)  $\{x : x \text{ is an odd natural number smaller than 10}\}$   
 (iii)  $\{m, a, t, h, e, i, c, s\}$  (c)  $\{x : x \text{ is a natural number and divisor of 6}\}$   
 (iv)  $\{1, 3, 5, 7, 9\}$  (d)  $\{x : x \text{ is a letter of the word MATHEMATICS}\}$
- 14) If  $A = \{a, b, c, d\}$ . How many subsets does the set A have?  
 (A) 5 (B) 6 (C) 16 (D) 65
- 15) Let  $A = \{1, 3, 7, 8\}$  and  $B = \{2, 4, 7, 9\}$ . Find  $A \cap B$ .
- 16)  $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ;  $B = \{2, 3, 5, 7\}$ . Find  $A \cap B$ .
- 17) If  $A = \{1, 2, 3, 4\}$  and  $B = \{2, 4, 6, 8\}$ . Find  $A \cup B$ .
- 18) Find  $A \cap B$  when  $A = \{5, 6, 7, 8\}$  and  $B = \{7, 8, 9, 10\}$ .
- 19) Let  $A = \{2, 5, 6, 8\}$  and  $B = \{5, 7, 9, 1\}$ . Find  $A \cup B$ .
- 20) Let  $A = \{a, e, i, o, u\}$  and  $B = \{a, i, u\}$ . Show that  $A \cup B = A$ .
- 21) Let  $A = \{1, 2, 3, 4, 5\}$ ;  $B = \{4, 5, 6, 7\}$ . Find  $A - B$ .
- 22) If  $A = \{1, 2, 3, 4\}$  and  $B = \{1, 2, 3, 5, 6\}$ , then find  $A \cap B$  and  $B \cap A$ . Are they equal?
- 23) If  $A = \{4, 5, 6\}$ ;  $B = \{7, 8\}$  then show that  $A \cup B = B \cup A$ .