Submission Date: 11-12-2019

1. Which of the following are null set or singleton ?

    (i) $A = \{x : x \in R \text{ and } x \text{ is a solution of } x^2 + 2 = 0\}$.

    (ii) $B = \{x : x \in Z \text{ and } x \text{ is a solution of } x - 3 = 0\}$.

    (iii) $C = \{x : x \in Z \text{ and } x \text{ is a solution of } x^2 - 2 = 0\}$.

    (iv) $D = \{x : x \text{ is a student of your school studying in both the classes XI and XII }\}$

2. If $A = \{4, 6, 8, 10\}$, $B = \{2, 3, 4, 5\}$

    R is a relation defined from A to B where

    $$R = \{(a, b) : a \in A, b \in B \text{ and } a \text{ is a multiple of } b\}$$
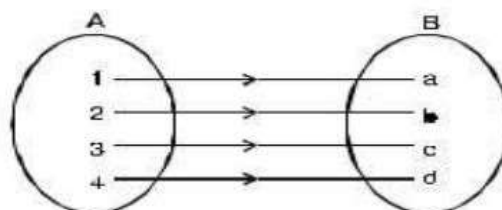
    find (i)R in the Roster form (ii) Domain of R (iii) Range of R .

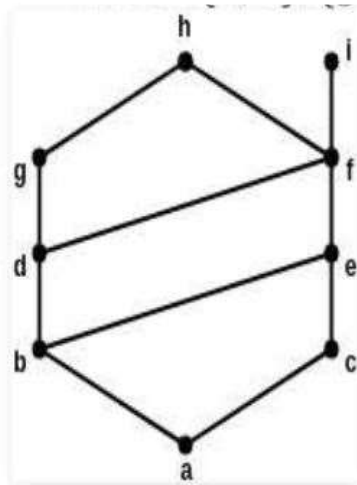3. Which of the following functions are one-to-one functions ?

    (a) $f : \{20,21,22\} \rightarrow \{40,42,44\}$ defined as $f(x) = 2x$

    (b) $f : \{7,8,9\} \rightarrow \{10\}$ defined as $f(x) = 10$

    (c) $f : I \rightarrow R$ defined as $f(x) = x^3$

    (d) $f : R \rightarrow R$ defined as $f(x) = 2 + x^4$

    (d) $f : N \rightarrow N$ defined as $f(x) = x^2 + 2x$

4. Which of the following functions are many-to-one functions ?

    (a) $f : \{-2,-1,1,2\} \rightarrow \{2,5\}$ defined as $f(x) = x^2 + 1$

    (b) $f : \{0,1,2\} \rightarrow \{1\}$ defined as $f(x) = 1$

    (c)

5 <u>V</u>erify whether following Hasse diagram is Lattice.

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6.   Convert following Boolean expression into disjunctive and conjunctive normal/canonical forms

$$F(A, B, C) = A'B + BC' + BC + AB'C'$$

$$F(A, B, C) = (A + B)(A + C)$$

Remark: Please try to do by your own to clear all the doubts. Don't copy from others.

By Dr. Sneha Jaiswal