4 WEDNESDAY 338-27

Tutorial 01

(1) Let A and B be two non-Empty set and subset of Universal set then prove that

(i) $(A-B) \cup (B-A) = (A \cup B) - (A \cap B)$

(ii) $A \cap (B-C) = (A \cup B) - (C-A)$

(iii) $(A \cap B) \times (C \cap D) = (A \times C) \cap (B \times D)$

(ii) Out of 800 students in a class, 60 play football, 53 play Hockey, and 35 both the games. How many students

(a) do not play of these games.

(b) play only Hockey but not football

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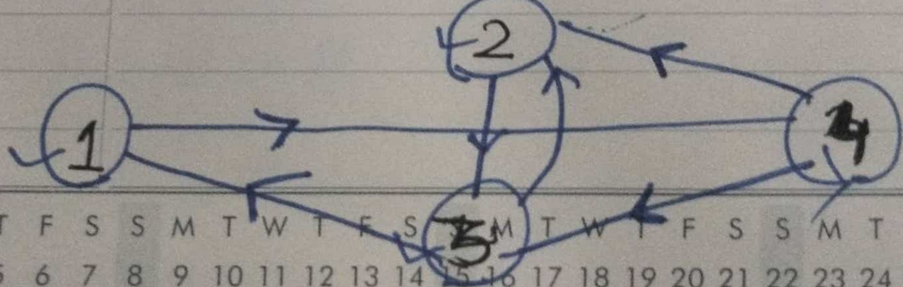
(iii) Consider a relation R defined on $A=\{1,2,3\}$ whose matrix representation is given below. Determine its Inverse R^{-1} and Complement R'

~~(iv) Consid~~

$$M_R = \begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 1 \\ 0 & 0 & 1 \end{bmatrix}$$

(iv) Consider a Relⁿ R whose directed graph is shown. Determine its inverse R^{-1} and Complement R'.



Tutorial 02

(i) Consider a relⁿ R from a set A to B whose matrix is shown below. Determine the matrix representation (i) R^{-1} (ii) R' in matrix where

$$MR = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$$

(ii) Let $A = \{2, 3, 4, 5\}$. The Rel^n R and S on A defined by

$R = \{(2,2), (2,3), (2,4), (2,5), (3,4), (3,5), (4,5), (5,3)\}$
$S = \{(2,3), (2,5), (3,4), (3,5), (4,2), (4,3), (4,5), (5,2), (5,5)\}$

Find the matrices of the above relations. Use the matrices to find the following compositions of the Rel^n R & S

(I) R o S (II) R o R (III) S o R

(iii) If the f^n $F: R \to R$ defined by $F(x) = x^2$, Find $F^{-1}(4)$ & $F^{-1}(-4)$

(iv) If $F: R \to R$ and $g: R \to R$ defined by
$F(x) = x^3 - 4x$, $g(x) = \dfrac{1}{x^2+1}$ $h(x) = x^4$

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Find Composition

(I) $(F \circ g \circ h)(x)$ (II) $(h \circ g \circ F)(x)$,

(III) $(g \circ g)(x)$ (IV) $(g \circ h)(x)$

(V) If $f: A \to B$ and $g: B \to C$ be one-to one, onto functions. then $g \circ f$ is also one-to-one & onto & prove $(g \circ F)^{-1} = F^{-1} \circ g^{-1}$

TUESDAY 337-28 3

(VI) Let the F^n $F: R \to R$ defined by.

$$F(x) = \begin{cases} 3x + 12 & \text{for } x > 3 \\ 2x^2 + 3 & \text{for } -2 < x \le 3 \\ 3x^2 - 7 & \text{for } x \le -2 \end{cases}$$

Find (I) $F^{-1}(5)$ (II) $F^{-1}(-5)$.

Find Composition

(I) $(F \circ g \circ h)(x)$ (II) $(h \circ g \circ F)(x)$

(III) $(g \circ g)(x)$ (IV) $(g \circ h)(x)$

(V) If $f: A \to B$ and $g: B \to C$ be one-to one, onto functions. then $g \circ f$ is also one-to-one & onto & prove $(g \circ F)^{-1} = F^{-1} \circ g^{-1}$

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Find (I) $F^{-1}(5)$ (II) $F^{-1}(-5)$.

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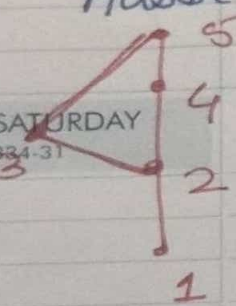
Tutorial 03

(i) Show that the given set is poset on set $A = \{1, 2, 3, 4\}$ and consider the Reln.

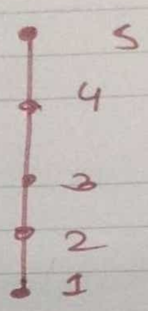
$$R = \{(1,1), (2,1), (2,2), (3,1), (3,3), (3,4), (4,4)\}$$

Show that R is partial ordering and draw it's Hasse Diagram

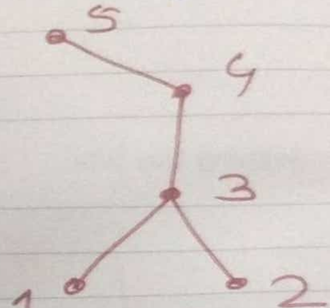
(ii) Let, $A = \{1, 2, 3, 4, 5\}$. Determine the relations represented by the following Hasse Diagram



(a)



(b)



(c)

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also find least, greatest, minimal & maximal

(iii) consider the divides relation on each of the following sets S. Draw the Hasse Diagram for each relation find

(a) All minimal & maximal element

(b) Greatest & least Element

1 SUNDAY 335-30

$S = \{2, 3, 5, 30, 60, 120, 180, 360\}$

$S = \{1, 2, 3, 4, 6, 9\}$