MATH 151

partial ordering Relations

Lecture 7

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Exercise 1: Let $P = \{(1,1),(2,1),(2,2),(3,1),(3,2),(3,3),(4,4)\}$ be a relation on $A = \{1,2,3,4\}$

i. Show that P is partial order
ii. Draw the Hass diagram of P
iii. Determine whether P is total order

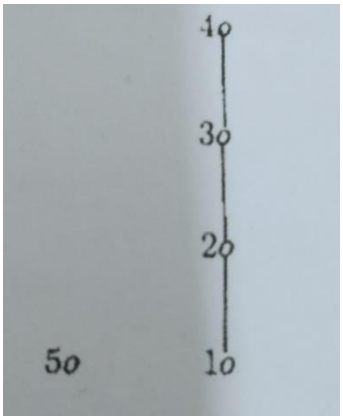
Exercise 2: Let $P = \{(1,1),(1,3),(2,1),(2,2),(2,3),(3,3),(4,1),(4,3),(4,4)\}$ be partial order on the set $A = \{1,2,3,4\}$

i. Draw the Hass diagram of P
ii. Determine whether P is total order

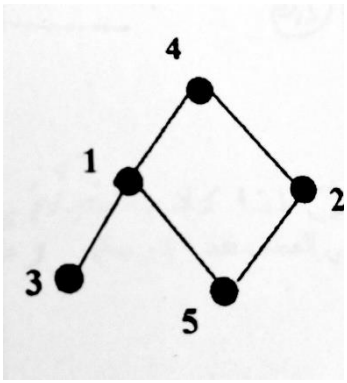
Exercise 3: Draw the Hass diagram representing the partial ordering relation

$P = \{(1,1),(2,2),(3,3),(4,4),(1,2),(1,3),(1,4),(2,4),(3,4)\}$ on the set $A = \{1,2,3,4\}$

Exercise 4: Let T be a relation represent by Hass diagram. List all order pairs of T

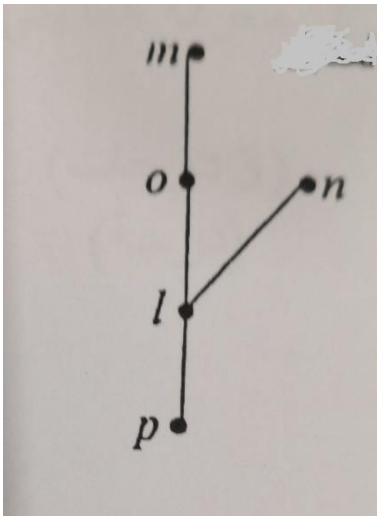


Exercise 5: Let T be partial order relation on $E=\{1,2,3,4,5\}$ represent by Hass diagram.



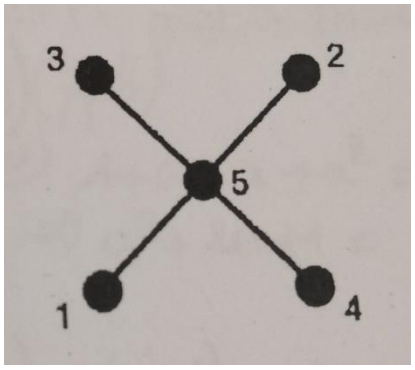
i. List all order pairs of T
ii. Determine whether T is total order

Exercise 6: Let T be partial order relation on $E=\{l,m,n,o,p\}$ represent by Hass diagram.



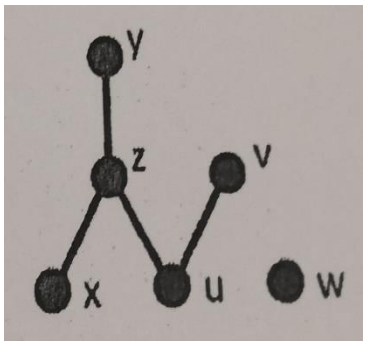
i. List all order pairs of T
ii. Determine whether T is total order

Exercise 7: Let T be partial order relation on $E = \{1,2,3,4,5\}$ represented by Hass diagram.



i. List all order pairs of T
ii. Determine whether T is total order

Exercise 8: List all order pairs of the partial order P on the set $B = \{u, v, w, x, y, z\}$ represented by the Hass diagram below



Exercise 9: Let S be the relation on $A=\{1,2,3,4,5,6,7,8,9,10\}$ such that $aSb \Leftrightarrow a/b$

i. Show that S is partial ordering relation
ii. Is S totally ordering relation on A
iii. Draw the Hass diagram for (A,S)

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Exercise 10: Let $A = \left\{2^m ; m \in \{0,1,2,...\}\right\}$. Define relation T on A by:

$2^m \; T \; 2^n \Leftrightarrow m \leq n$

i. Show that T is partial ordering relation
ii. Draw the Hass diagram for T on the set $E = \{16,8,2,64,4\}$

Exercise 11: Let P be the relation on $\mathbb{Z}^+$ such that $x\ P\ y \Leftrightarrow x\ /(x+y)$

i. Show that P is partial ordering relation
ii. Is P totally ordering relation on
iii. Draw the Hass diagram for P on the set $E=\{2,3,4,8\}$

Exercise 12: Let T be the relation on $\mathbb{Z}^+$ such that $x\,T\,y \Leftrightarrow \left(\frac{x}{y}\right)$ is odd number

i. Show that T is partial ordering relation
ii. Is T totally ordering relation on
iii. Draw the Hass diagram for T on the set $E = \{1,2,3,5,6,10,15,18\}$

Exercise 13: Let P be the relation on $\mathbb{Z}$ such that $x\ P\ y \Leftrightarrow x - y = 2k\ ; k \geq 0$

i. Show that P is partial ordering relation
ii. Is P totally ordering relation on
iii. Draw the Hass diagram for P on the set $E = \{0,1,2,3\}$