Subject Name: Mathematic II
Topic: Partial Order Relations and Lattices Part -II

By

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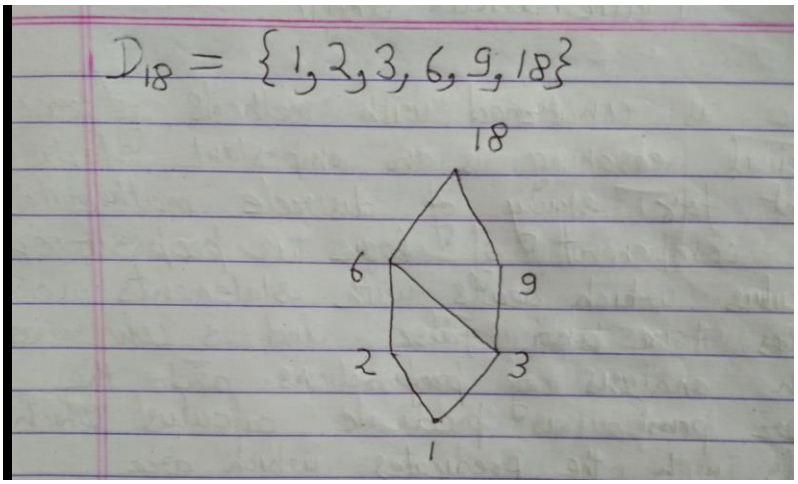
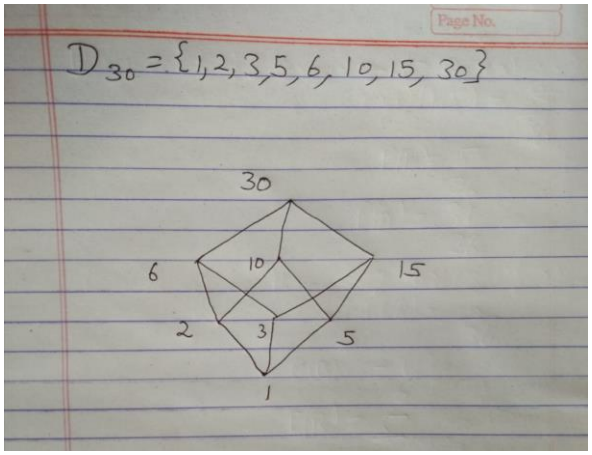
Hasse Diagram A partial order relation $(\leq)$ on a finite set P can be represented by a diagram called the Hasse diagram.

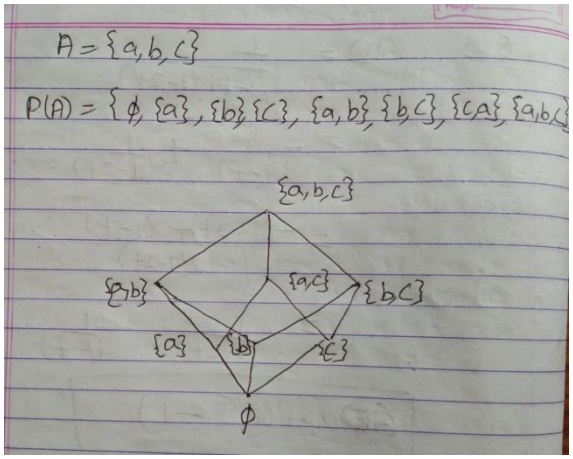
Ex. The Set D_{18} of positive integers, the relation "|" (divides). Its hasse diagram is



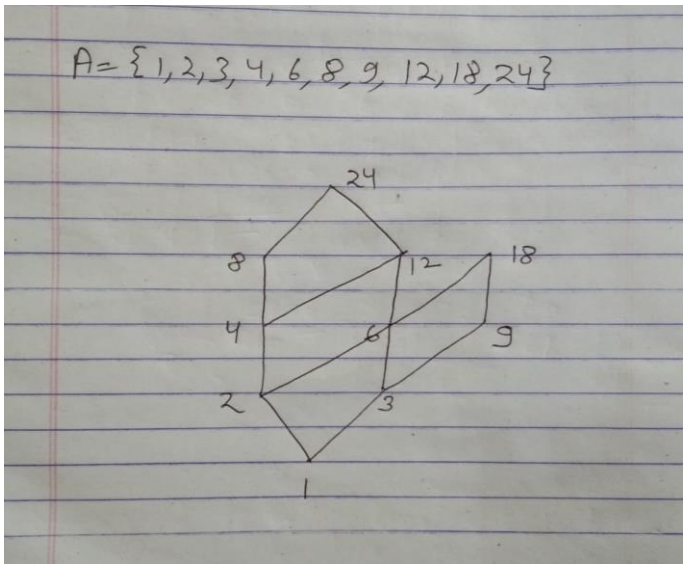
Q. the Hasse diagram of the set of positive integers divisible by 30 with the relation "|" is shown by



Q. Let A= {a, b, c} and P(A) its power set. Draw Hasse diagram of $(P(A), \subseteq)$.

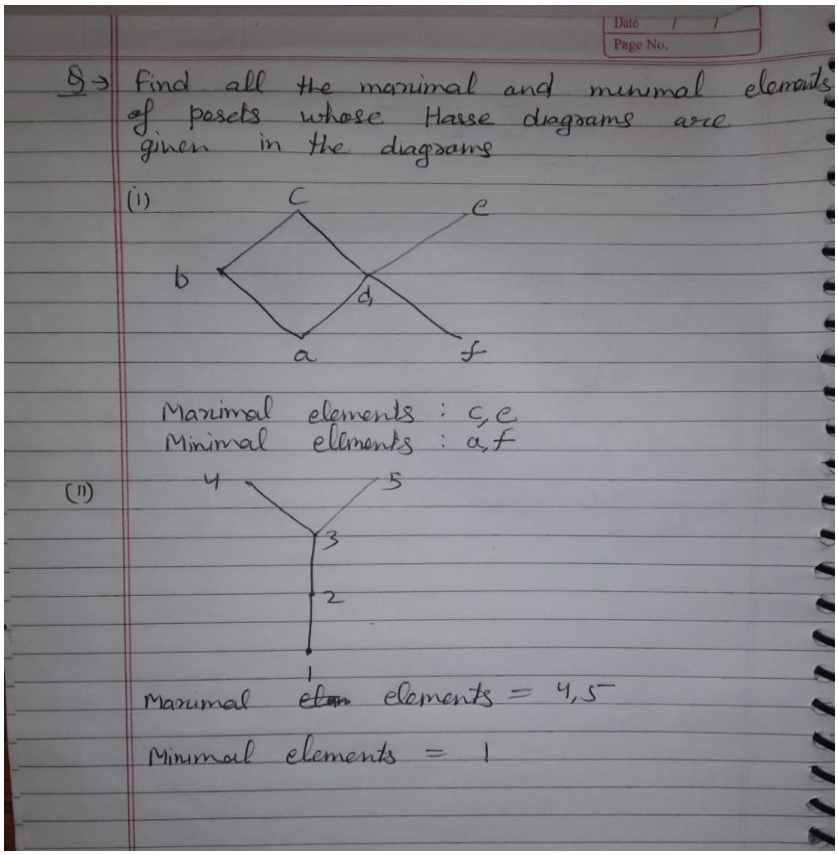


Q. Let A = {1, 2, 3, 4, 6, 8, 9, 12, 18, 24} be ordered by the relation “a divides b”. The Hasse diagram is

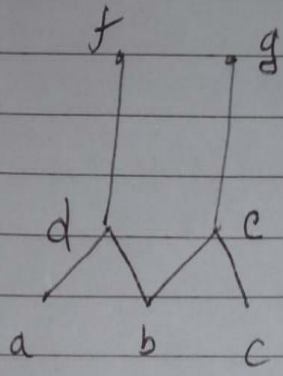


Maximal Element, Minimal Element

An element belonging to a point $(a, \leq)$ is said to be Maximal element of A, if there is no element c in A such that an $a \leq c.$ An element $b \in A$ is said to be Minimal element of A if there is no element c in A such that $c \leq a.$



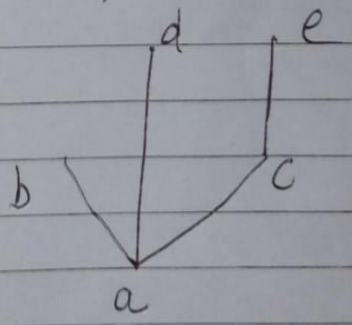
(III)



Maximal elements = f, g

Minimal elements = a, b, c

(IV)



Maximal elements = b, d, e

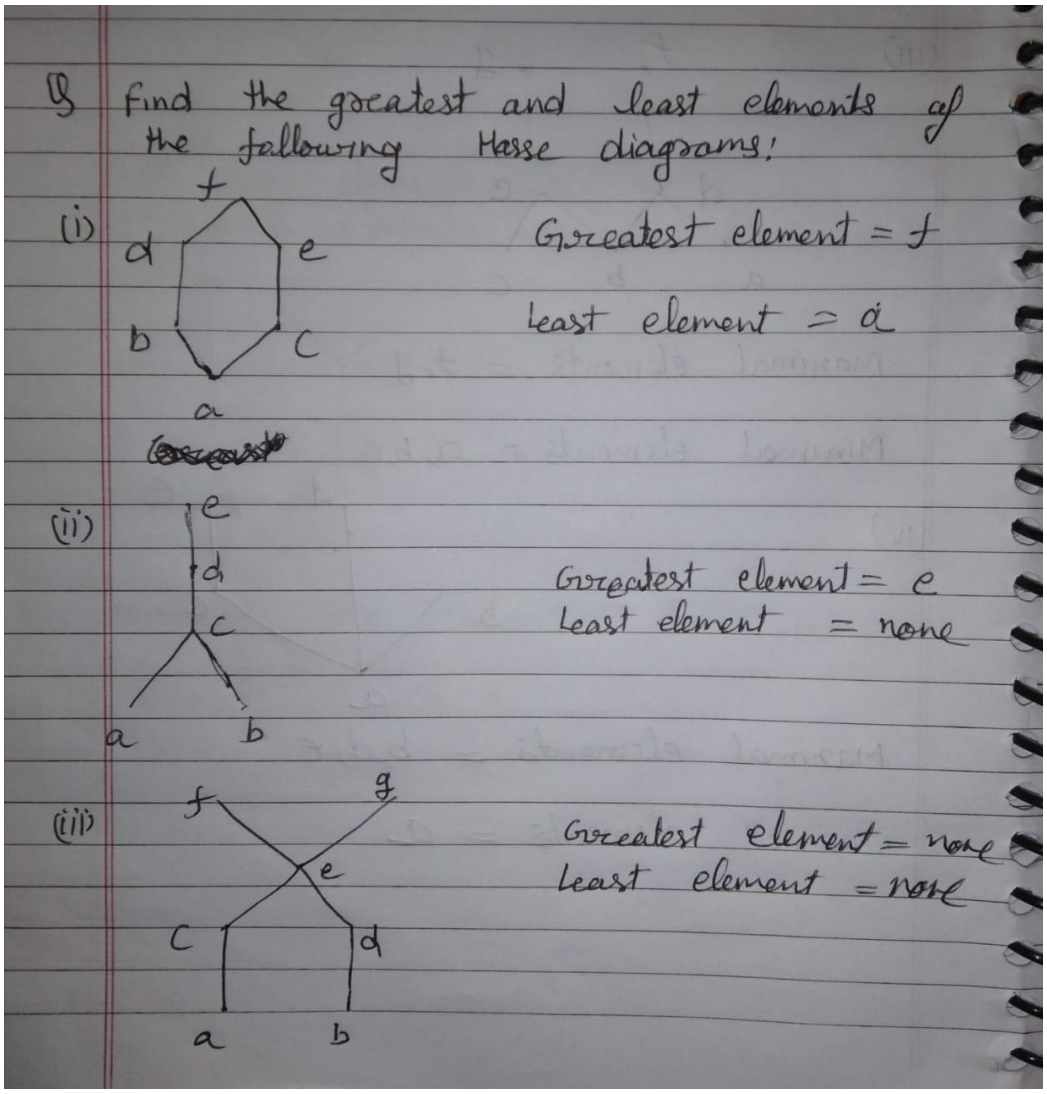
Minimal elements = a

Greatest Element, Least Element

An element $a \in A$ is said to be a Greatest element of A, if $x \leq a$ for all $x \in A$. An element $a \in A$ is called a Least element of A, if $a \leq x$ for all $x \in A$.

The least element is also called first element or zero element of A. the least element if exist is unique.

The greatest element is also card last element or unit element of A the greatest element if exist is unique.



Referential Books:

1. S.K. Sarkar, “Discrete Maths”; S. Chand & Co.,2000.
2. “Discrete Structure”; Shree Sai Prakashan.
3. “Discrete Mathematics”, Schaum’s Outlines.