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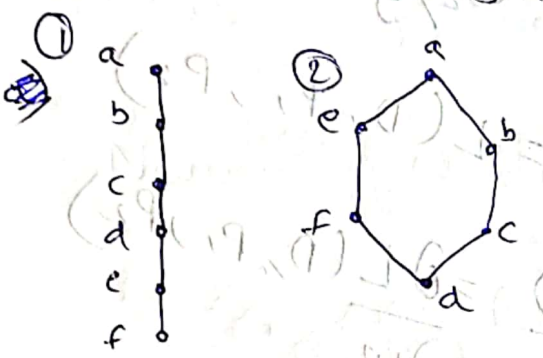
Q2



→ Three 6 element Hasse diagram

a) ① {a, b, c, d, e, f}

{b, c, d, e, f}

{c, d, e, f} {d, e, f} {e, f} {f}

② {a, b, c, d, e, f}

{e, f, d} {b, c, d}

{f, d} {c, d} {d}

③ {a, b, c, d, e, f}

{b, c, d, f, e}

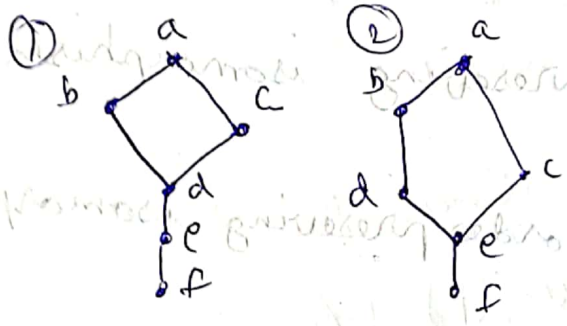
{c, d, f, e} {f, e} {d, e} {e}

Q3 Any set of rational number that is bigger than for some $a \in \mathbb{Q}$, i.e

$$\{q \mid q \in \mathbb{Q} \text{ and } q \geq a\}$$

where $a \in \mathbb{Q}$

Q2



(b) ① $\{a, b, c, d, e, f\}$ $\{a, b, c, d, e\}$

$\{a, b, c, d\}$ $\{a, b\}$ $\{a, c\}$ $\{a\}$

② $\{a, b, c, d, e, f\}$ $\{a, b, c, d, e\}$

$\{a, b, d\}$ $\{a, c\}$ $\{a, b\}$ $\{a\}$

Q1 Let f is a lattice isomorphism (w.r.t join & meet)

then let $x, y \in L$

$$f(x \vee y) = f(x) \vee f(y)$$
$$f(x \wedge y) = f(x) \wedge f(y)$$

So if $x \leq y$

then $f(x) \leq f(y)$ } — ①

as $y = x \vee y$ and $f(y) = f(x) \vee f(y)$

Now if $f(x) \leq f(y)$

$$f(y) = f(y) \vee f(x)$$
$$= f(y \vee x)$$

$\therefore y = y \vee x$ (bijection) — ②

$x \leq y$

$\therefore$ From ① & ② and duality

f is order preserving isomorphism

Now let f is order preserving isomorphism

Let $x, y \in L$

then $x \leq y \Rightarrow f(x) \leq f(y)$

and $f(x) \leq f(y) \Rightarrow x \leq y$

(4) Since L is finite, then $Id(L)$ is finite

∴ Ideals are principle and have a generator

Isomorphic mapping

Let $x \in L$

then $f(x) = \downarrow x$

f is isomorphic because

one-one mapping exists

i,e $f(x) = f(y)$

$\downarrow x = \downarrow y$

then $Join(\downarrow x) = Join(\downarrow y)$

$\Rightarrow x = y$

Onto

$x \leq y \Rightarrow f(x) \leq f(y)$

and $f(x) \leq f(y) \Rightarrow x \leq y$