I hereby pledge on my honor that I will strictly adhere to academic integrity codes and the work done on this examination is solely my own and I will not receive/give any help from/to anybody or source during this examination.

a) Group = monoid + invertable = Semigroup + neutral element
                                                      + invertable

Group is denoted like $(A, \circledast)$
                        ↓   ↓
                       set   operator

→ The operator $\circledast$ must associative and distributive under this set

→ There should be an identity element in the set

→ Every element must have an inverse in the set

b) A ring is denoted like $(R, \oplus, \otimes)$

$\oplus$ operator must be commutative under this set

(Abelian group for $\oplus$)

It is at least monoid for the operator $\otimes$

And it is linked by distributive property

ex: $a \otimes (b \oplus c) = (a \otimes b) \oplus (a \otimes c)$

c) Group → $(\mathbb{Z}, +)$, Integers under addition

Ring → $(R, +, \times)$, Real numbers under addition and multiplication

$(R, \times)$ → is not a group,
          because it is not invertable
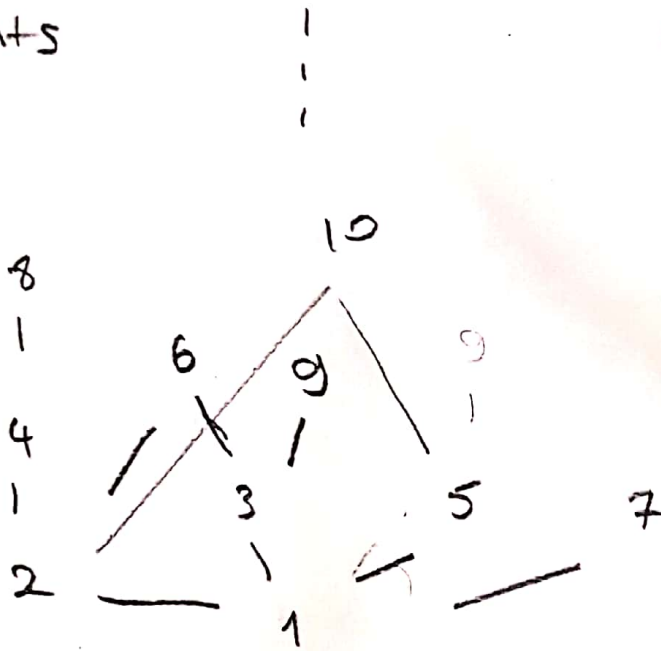   for 0, so it is monoid

d) **Def. of Lattice :** In a POSET , if for every pair of elements have a least upper bound and greatest lower bound then it is lattice

Hasse Diagram :

For the first 10 elements

It is lattice. Because for every pair greatest lower bound is greatest common divisor. And the least upper bound is

< EKOK >

(I don't know what it is in English)

8
1
4
1
2

6
3

10
9

5   7
1

$glb = 1$
For (3,5)
$lub = 15$

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