Total No. of Questions : 6]   [Total No. of Printed Pages : 4

EG-208

B.E. II Semester (CGPA) CSE

Examination 2018

DISCRETE STRUCTURE

Paper - CS-205

Time Allowed : Three Hours]   *[Maximum Marks : 60*

Note : i) Attempt all six questions.

     ii) All questions carry equal marks.

     iii) Symbols have their usual meanings.

Q.1.   Write short notes on the following :   10

    a)   Deduction theorem

    b)   Power sets

    c)   Pseudo-Boolean lattices

(2)

d) Morphisms

e) Pigeon-hole principle

Unit - I

Q.2. Prove that $f^{-1}(A \cup B) = \{f^{-1}(A)\} \cup \{f^{-1}(B)\}$.

10

OR

If $A = \{1, 2, 3\}$ and $B = \{2, 3, 4\}$, then find out the relation from A to B, defined by "is less than". Find out the domain and range of the relation.

Unit - II

Q.3. Show that the following is invalid. "If I buy stocks, I will lose money. Therefore, If I lose money, I buy stocks".
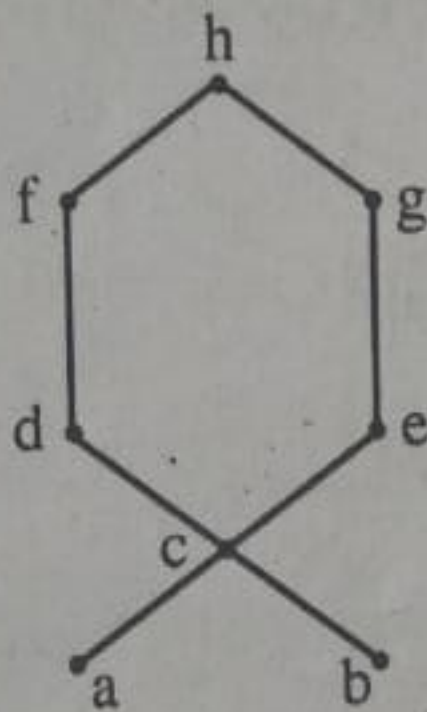
10

OR

Differentiate with examples :

a) Finite and Infinite sets

b) Countable and Uncountables

Unit - III

Q.4. Consider the po-set A = {a, b, c, d, e, f, g, h} be represented by the following Hasse diagram. Determine all lower and upper bounds of the subsets. ·   10

OR

What do you mean by complete Lattice and Monotonic function? State and prove Knaster-Tarski's fixed points theorem.

Unit - IV

Q.5. What is the difference between a ring and a field? If R is a ring such that $a^2 = a, \forall\, a \in R$ 10

Prove that:

i) $a + a = 0, \forall\, a \in R$

ii) $a + b = 0, \Rightarrow a = b$

(4)

OR

Explain free and cyclic monoids.

Unit - V

Q.6. Draw a graph with the given adjacency matrix. 10

a) $\begin{bmatrix} 1 & 3 & 2 \\ 3 & 0 & 4 \\ 2 & 4 & 0 \end{bmatrix}$

b) $\begin{bmatrix} 1 & 2 & 0 & 1 \\ 2 & 0 & 3 & 0 \\ 0 & 3 & 1 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$

Also define degree, path, cycle.

OR

Explain with suitable examples :

i) Isomorphism

ii) Planar graph

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