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Name of Examination : **Winter 2020** - (Preview)

Course Code & Course Name : **CO204U - Discrete Structures and Graph Theory**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Solve all

- a) Explain set operation with Venn diagram . [6]
 - a) Union
 - b) intersection
 - c) symmetric difference
- b) Verify that the proposition [6]

$$p \vee \sim(p \wedge q)$$

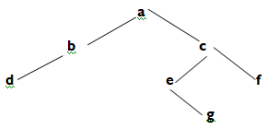
is tautology.

2) Solve all

- a) Explain Reflexive symmetric and transitive relation with one example [6]
- b) Let $L = \{1, 2, 3, 5, 30\}$ and R be relation 'is divisible by' prove that , L is lattice [6]

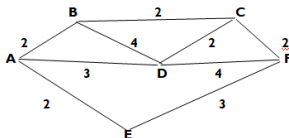
3) Solve any two

- a) Find which of following relation are function and given domain and co domain [3]
 - i). $\{(1,0) (1,1) (2,8) (5,9)\}$
 $A = \{1, 2, 5\}$
 $B = \{0, 1, 8, 9\}$
 - ii). $\{(1,2) (3,7) (4,8) (5,12)\}$
 $A = \{1, 3, 4, 5\}$
 $B = \{2, 7, 8, 12\}$
- b) Explain types of function with proper example [6]
- c) Solve All [3]
 - i). Draw binary search tree by inserting following number from left to right .
 11, 6, 8, 19, 4, 10, 5, 17, 43, 49, 31
 - ii). Find inorder , preorder and post order traversed by binary tree step by step [3]

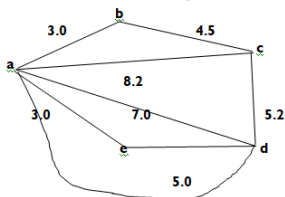


4) solve any two

- a) Use Dijkstra's algorithm to find shortest path between 'A' to 'F' in given graph [6]



- b) Find minimum spanning by prim's algorithms [6]



- c) Show that Z (set of integer) satisfies properties : closer , associative , existence of identity , existence of inverse , under binary operation addition [6]

5) Solve any two

- a) Differentiate prim's and kruskal's algorithm [6]
- b) Define the terms [6]

- i). Semi Group
- ii). Monoid Group
- iii). Group
- iv). Abelian group
- v). Cyclic Group
- vi). quotient Group
- c) Explain following terms with example.
 - i). Eulerian path
 - ii). Complete Graph
 - iii). Planar Graph

[2]

[2]

[2]

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