

17U125

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Name:

Reg. No.....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2017

(Regular/Supplementary/Improvement)

(CUCBCSS-UG)

CC15UBCA1 C02/ CC17UBCA1 C02- DISCRETE MATHEMATICS

(Mathematics - Complementary Course)

(2015 Admission Onwards)

Time: Three Hours

Maximum: 80 Marks

Part A

Answer *all* questions. Each question carries 1 mark

1. What is Tautology?
2. Define Equivalence Relation?
3. State absorption Law
4. Define proposition in mathematical logic?
5. Define Complete Graph
6. What is Hamiltonian Graph?
7. What is cut Vertex?
8. State the property of Binary Tree
9. Define Path?
10. $K_{m,n}$ is a complete bipartite graph. How many edges present in this graph?

(10x1=10 Marks)

Part B

Answer *all* questions. Each question carries 2 marks.

11. Prove that a simple graph G is connected if and only if it is spanning tree.
12. State and prove De-Morgan's Laws
13. Explain Laws of Logic
14. Differentiate between walk and path in a graph.
15. Define travelling sales man problem.

(5x2=10 Marks)

Part C

Answer *any five* questions. Each question carries 4 marks

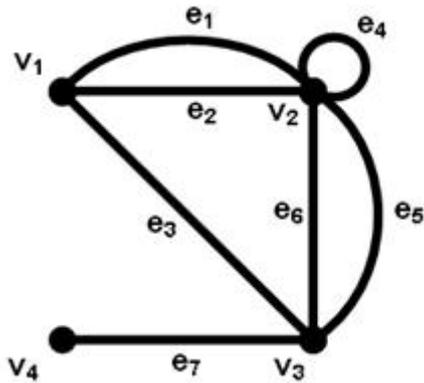
16. Explain least upper bound and greatest lower bound
17. Mention the difference between regular and bipartite graph.
18. Explain Kuratowski's two graph in detail.
19. Explain Logical operators in detail
20. Explain operations of graph in detail.
21. What is Isomorphism? Explain it with an example
22. Differentiate walks, paths and circuits
23. Explain Euler Graphs and Euler Circuit

(5x4=20 Marks)

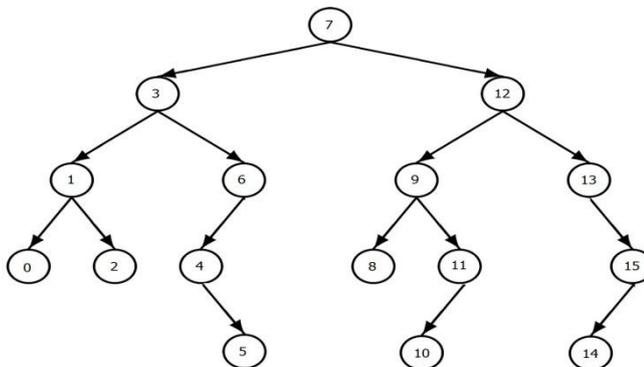
Part D

Answer *any five* questions. Each carries 8 Marks

24. Explain max-flow min cut theorem
25. Explain Kruskal's Algorithm with example
26. Draw $K_{2,2}$, $K_{2,5}$, K_3 , K_5
27. Write Incident matrix of following graph



28. Draw the on-off circuit diagram for the following Boolean functions:
 - a)
 - b)
29. Explain types of relations with example
30. Consider binary tree shown below:



- a) Find the level of each vertex.
 - b) Find the height or depth of each vertex.
 - c) List the children of each vertex.
31. State and prove Euler's formula.

(5x8=40 Marks)
