QP Code : U24A078

Reg. No : .....

Name : .....

ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

I SEMESTER BCA (FYUGP) DEGREE EXAMINATION, November 2024

BCA1CJ103 : Discrete Structures for Computer Applications

2024 Admission Onwards

(Credits: 4)

Time : 2 Hours **Maximum Marks : 70**

Section A

*[Answer **all.** Each question carries **3** Marks]* ***(Ceiling: 24 Marks)***

1. Define tautology. [BTL1]
2. Construct truth table for P→(QVR). [BTL3]
3. Compare injective and subjective functions with example. [BTL3]
4. Find x and y such that (2x, x+y) = (6,2). [BTL4]
5. Explain equivalence classes. [BTL2]
6. Construct the union of P3 and K5. [BTL3]
7. Define Handshaking theorem. [BTL1]
8. Solve K3 U K4. [BTL3]
9. Find the centre of P5. [BTL1]
10. Explain Cut-Vertex. [BTL2]

Section B

*[Answer **all.** Each question carries **6** Marks]* ***(Ceiling: 36 Marks)***

11. Show that [(PVQ)→R]∧(¬P)→(Q→R) is a tautology with & without using truth table. [BTL2]
12. Solve the given operations and draw corresponding Venn diagrams for A={2, 4, 6, 8, 10, 12} and B={0, 4, 8, 12, 16}. [BTL3]

    a) AUB *b) A∩B* *c) B-A* *d) AXA* *e) AXB*

13. Construct a complete graph with 5 vertices and explain the properties of complete graph. [BTL3]
14. What is Hamiltonian graph and explain its characteristics. [BTL2]
15. Distinguish between adjacency matrix and incidence matrix. [BTL4]
16. Explain Eccentricity, cut-sets and cut-vertices in graphs with suitable examples. [BTL4]

Turn Over

17. Show that in a tree every vertex of degree greater than one is a Cut-vertex. [BTL1]

18. Show that every connected graph contains a spanning tree. [BTL1]

Section C

*[Answer **any one.** Each question carries **10** Marks]* ***(1x10=10 Marks)***

19. Detail the properties & operations of sets with comprehensive explanations and examples. [BTL2]

20. Discuss travelling salesman problem in detail. [BTL5]

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