QP Code: U25DRIS058

Reg. No : .....

Name : .....

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

I SEMESTER (FYUGP) DEGREE EXAMINATIONS, NOVEMBER 2025

(Regular/Improvement/Supplementary)

BCA

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. Write an example of a compound statement using conjunction and find its truth value.
2. A = {x : x is a multiple of 3 and x<15}. Write the set in the Roster form and find its cardinality.
3. Define Eulerian Graph.
4. Write the symbolic form of the statement : If the alarm rings, then there is fire. Determine the truth value of the implication: When the alarm does not ring and there is no fire.
5. Find a relation which is reflexive and transitive but not symmetric.
6. Represent the sets in Roaster form:
   a) P={x|x is a vowel in English alphabet}
   b) Q={x|x is a real number and x^2=4}
7. Identify a closed and open walk from a regular graph.
8. Distinguish between Rooted trees and Binary trees.
9. Compare the chromatic number of a complete graph and a cycle graph.
10. Explain the Idempotent law and Commutative law with examples.

Section B

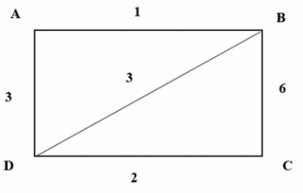
*Answer **all**. Each question carries **6** Marks.* ***(Ceiling: 36 Marks)***

11. Show that PV(QΛR) and (PVQ)Λ(PVR) are logically equivalent.
12. What is one-to-one correspondence? Explain how can we establish a one-to-one correspondence between the sets A={1,2,3} and B={a,b,c}. Illustrate with a mapping.

Turn Over

13. Explain the Handshaking Theorem with an example.

14. Find the minimum spanning tree from the given graph using Prim's algorithm starting from vertex A.



15. Explain the differences between Universal quantifier (∀) and Existential quantifier (∃) with examples.

16. Create a di-graph representing an equivalence relation on the set {1, 2, 3}.

17. Distinguish between planar and non-planar graphs using examples.

18. Analyze the properties and types of trees with example.

Section C

*Answer **any one**.* ***(1x10=10marks)***

19. Describe various types of functions in set theory with examples.

20. Describe the various types of graphs with examples.

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