QP Code: UV25DR011

Reg. No : ....................
Name : ....................

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

## I SEMESTER (FYVP) DEGREE REGULAR EXAMINATIONS, NOVEMBER 2025

**B. Voc. Software Development**

**SFD1CJ103 : DISCRETE MATHEMATICS**

**2025 Admission Onwards**

**(Credits: 4)**

**Time: 2 Hours** **Maximum Marks: 60**

### Section A

*Answer **all** questions. Each carries **2** Marks.* ***(Ceiling 20)***

1. Construct the truth table for $\neg p \leftrightarrow q$.
2. Let $p$ : Bats are blind, $q$ : Gnats eat grass. Express the following proposition symbolically.
   If bats are blind then Gnats don't eat grass.
3. Define Disjunction.
4. State Complement laws of logic.
5. Let $A = \{1, 2, 3, 4, 5\}$ , $B = \{4, 5, 6, 7\}$ and $C = \{2, 3, 5, 6, 7\}$. Find $A \cap (B \cup C)$.
6. Define Partially ordered set.
7. Define a simple graph and give an example.
8. Describe the terms isolated vertex and pendant vertex.
9. Define a regular graph and draw a regular graph of degree 3.
10. Draw any two minimally connected graphs.
11. Explain reachable vertices.
12. Explain the term : cut edge.

### Section B

*Answer **all** questions. Each carries **6** Marks.* ***(Ceiling 30)***

13. Prove that $(p \to q) \wedge p$ logically implies $q$.
14. State the converse, inverse and contrapositive of the proposition " If sun is shining then pigs eat turnips".

**Turn Over**

15. Check whether the relation $R = \{(0,0),(1,1),(2,0),(2,2),(2,3),(3,3)\}$ on the set $S = \{0,1,2,3\}$ is a partial order relation.

16. Show that the number of edges in a $k-$regular graph is $\dfrac{n \cdot k}{2}$.

17. Explain planar graph with an example.

18. Explain the coloring of a graph with the help of an example.

**Section C**

*Answer* ***any One****. Each carries* ***10*** *Marks.* ***(1X10=10 Marks)***

19. Out of 200 students in a management school 120 students read Indian Economic Review and 100 read Harvard Business Review. If the number of students who read neither of the journals is 40 then find the number of students who read both.

20. i) Describe adjacency matrix and incidence matrix of a graph.
ii) Draw a graph with 5 vertices and 10 edges and give its adjacency matrix.

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