BC–290 (A)

B.C.A. (Part-II) Examination, 2022

DISCRETE MATHEMATICS

Paper – BCA–205

(For Due Paper)

Time : 3 Hours]   [*Maximum Marks : 50*

Note :– Attempt *five* questions in all, selecting *one* question from each Unit. All questions carry equal marks.

Unit–I

1. (a) Explain the concept of normal forms with suitable examples.

   (b) Describe any *five* logical operations with suitable examples.

Or

2. (a) Write the truth table for the following compound statement and explain it :

$$(x \vee y) \wedge \big((y \wedge y) \vee (x \vee x)\big)$$

   (b) Explain the differences between contradiction and tautology with suitable example.

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Unit–II

3. Use the concept of mathematical induction to show $(n-1)n\,(n+1)$ is completely divisible by 3, if n is a positive integer.

Or

4. Explain the congruence relation with suitable examples in detail.

Unit–III

5. Define a Poset. What kind of properties a poset satisfy ? Take an example of poset and show that it satisfies all the properties of a poset.

Or

6. Explain any *five* set operations with suitable examples of each.

Unit–IV

7. Explain the concept of sum of products with suitable examples.

Or

8. Describe the representation theorem with suitable examples in detail.

Unit–V

9. How many different colors are required to color the modes of a graph, if total no. of nodes in the graph is 5 ? Explain by justifying your answer.

Or

10. Describe the situations where depth first search and breadth first search can be used efficiently. Give suitable examples to explain the same.