

9. Define tree and explain the following :

20

- (i) Left child
- (ii) BST
- (iii) Complete binary tree
- (iv) Preorder traversal

Roll No. ....

**24041**

**B. Tech. 3rd Semester (CS & IT)  
Examination – December, 2022**

**DISCRETE STRUCTURE**

Paper : CSE-203-F

*Time : Three Hours ] [ Maximum Marks : 100*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. **1** is *compulsory*. All questions carry equal marks.

**1.** Write short notes on the following : 20

- (a) Tautology
- (b) AP series
- (c) Automorphism
- (d) Connected graph and connected component

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UNIT - I

2. Describe the following : 20
- (i) Disjoint sets
  - (ii) Improper subset
  - (iii) Power set
  - (iv) Symmetric difference of sets
3. (i) Define Relation. Explain properties of relations in detail. 7
- (ii) Describe the composition of functions in detail. 7
  - (iii) What are derived connectors ? Explain. 6

UNIT - II

4. (i) Two dice are tossed once. Find probability of getting an even number on first die or a total of 8. 10
- (ii) Two cards are drawn from a pack of 52 cards, one after the other without replacement. Find the chance that one of these cards is an ace and other is queen of opposite shade. 10

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5. (i) Show that the sequence defined by  $\mu_n = 3n^2 - 5$  is not an AP series. 10
- (ii) Solve the difference equation  $a_r + 6a_{r-1} + 9a_{r-2} = 3$  with initial condition  $a_0 = 0, a_1 = 1$ . 10

UNIT - III

6. Explain the following : 20
- (i) Semi group
  - (ii) Cyclic group and its properties

7. Describe the following : 20
- (i) Integral domain
  - (ii) Cosets

UNIT - IV

8. Write short notes on the following : 20
- (i) Labelled Graph
  - (ii) Multigraph
  - (iii) Planar Graph
  - (iv) Isomorphic Graph

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