B.Sc. (Data Science) (NEP Pattern) First Year Semester-I

BSCDS012 : Discrete Mathematics

P. Pages : 2 **GUG/W/23/15256**

Time : Two Hours * 8 2 3 9 * Max. Marks : 40

---

1. a) Explain recurrence relations – Black tracking method. **4**

b) Explain linear ordering Hasse Diagrams. **4**

OR

c) Explain solution of recurrence relation by method of generation functions. **4**

d) Define tower of Hanoi. **4**

2. a) State and prove Binomial Theorem. **4**

b) Explain Tree diagram for solving counting problems. **4**

OR

c) Define- **4**

i) Pascal Identity

ii) Vandermonde Identity

d) Define- **4**

i) Intersection of lines in a plane

ii) Two way counting

3. a) Explain shortest path and linked representation of a graph. **4**

b) Define- Breadth – first search and Depth- first search. **4**

OR

c) Define- **4**

i) Adjacency matrix

ii) Path matrix

d) Define- **4**

i) Ordered rooted tree ii) Binary trees

4. a) Explain representing binary trees in memory. **4**

b) Define **4**

i) Transversing binary trees

ii) Binary search tree

OR

c) Explain Algorithms for deleting in a binary search tree. **4**

d) Explain applications – formulate and solve recurrence relation for Fibonacci Numbers. **4**

5. a) Definition of Domain and codomain. **2**

b) Definition of Injective and surjective functions. **2**

c) Definition – **2**

i) Bijective functions

ii) Inverse Functions

d) Definition – **2**

i) Graphs

ii) Trees

****