

B.Sc. First Year (Data Science) NEP Semester-I
BSCDS012 - Discrete Mathematics

P. Pages : 1

Time : Three Hours



GUG/S/25/15256

Max. Marks : 40

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1. a) A Finite Non Empty Poset (P, R) has atleast one Maximal element and atleast one minimal. 4
- b) Draw the Hasse diagram representing the partial ordering $\{(a, b) / a \text{ divides } b\}$ on: $\{1, 2, 3, 4, 6, 8, 12\}$ also find maximal and minimal element. 4
- OR**
- c) Find the inverse $g(x)$ of bijective function $f(x) = 2x - 3$ for $f, g: R \rightarrow R$. Verify the inverse by showing $f \circ g(x) = x = g \circ f(x)$. 4
- d) Show that the set $A = \{1, 2, 3, 4\}$ under the divisibility relation is not totally ordered. 4
2. a) Difference between Permutations and Combination. 4
- b) Define Tower of Hanoi. 4
- OR**
- c) Explain non homogeneous recurrence relation and particular Solution. 4
- d) Explain Binomial Theorem. 4
3. a) In how many of the distinct permutations of the letters in MISSISSIPPI do the four I's not come together? 4
- b) A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has.
(i) no girls (ii) at least one boy and one girl (iii) at least three girl 4
- OR**
- c) Explain Vandermonde's identity. 4
- d) Explain Pascal Identity. 4
4. a) Explain Diagraph. 4
- b) Define - Path Matrix with example. 4
- OR**
- c) Define- i) Ordered rooted tree ii) Binary tree 4
- d) Explain types of binary trees. 4
5. a) What is Greatest integer function? Write domain and range of it. 2
- b) Define POSET and TOSET. 2
- c) Definition of Composite and Inverse Function. 2
- d) Define 2
- i) Codomain ii) Domain.
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