Roll No. 2282300212

Total No. of Questions : 6] [Total No. of Printed Pages : 4

EX-211

B.Tech. III[rd] Semester (New Scheme) CSE

Examination, 2022-23

Discrete Structure

Paper - CS-305

Time : 3 Hours] **[Maximum Marks : 60**

Note :- Questions No. 1 is compulsory. Attempt one question from each unit.

1. Explain the brief.

(i) Countable and uncountable sets

(ii) Partial ordering relation

(iii) Isomorphic graphs

(iv) Homogeneous solutions

(v) Abelian group

Unit-I

2. (a) Proof the identity :

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$$

(b) Differentiate between predicate and propositional logic.

OR

(a) Explain the principle of Inclusion. Exclusion.

(b) If $n(A-B) = 18, n(A \cup B) = 70$ and $n(A \cap B) = 25$, then find n (B).

Unit-II

3. (a) Using the principle of mathematical induction, prove that

$1^2 + 2^2 + 3^2 + \ldots\ldots + n^2 = (1/6)\{n(n+1)(2n+1)$ for all $n \in N$.

(b) Explain various application of RDBMS.

OR

(a) Prove that a function $f : R \to R$ defined by $f(x) = 2x - 3$ is a bijective function.

(b) Explain combinatorics with example.

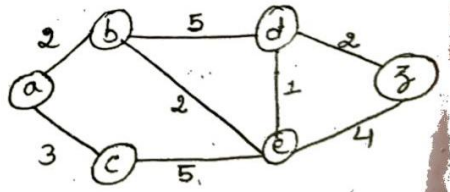
Unit-III

4. (a) Define graph. Also describe various types of graphs.

(b) Show that a regular binary tree has an odd number of vertices.

OR

Find the shortest path between to z using Dijkstra's algorithm.



Unit-IV

5. Solve the recurrence relation

$F_n = 3F_n - 1 + 10F_n - 2 + 7.5$ where $F_0 = 4$ and $F_1 = 3$

OR

What do you understand by linear recurrence relations. How to solve linear recurrence relations explain with an example.

Unit-V

6. Describe the following terms with example :

(i) Homomorphisms

(ii) Normal subgroups.

OR

Prove that for any a and b in Boolean Algebra :

$\overline{a \vee b} = \bar{a} \wedge \bar{b}$

$\overline{a \wedge b} = \bar{a} \vee \bar{b}$

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