TCS-301 1106 Printed Pages : 3

Paper Code & Roll No. to be filled in your Answer Book

Roll No. | | | | | | | | | | |

B. Tech. II Year (III Sem.)

Odd Semester Examination-2015

Discrete Structures

Time : 3 Hours] *[Maximum Marks :100*

Answer Any Four (4x5=20)

Q1. Define the following term and give an example for each:

(i) Set

(ii) Power Set

(iii) Empty Set

(iv) Venn Diagram

(v) Proper set

Q2. Using the law of set theory, simplify each of the following:

(i) $A \cap (B-A)$

(ii) $(A - B) \cap (C - B)$

Q3. In a survey of 300 students, 64 had taken a Mathematics course, 94 had taken a Engilish course, 58 had taken a Computer course,28 had taken both a Mathematics and a Computer course,26 had taken both a Engilish and a

Mathematics course,22 had taken both a Engilish and a Computer Course,14 had taken all three course.How many students were surveyed who had taken none of three course.

Q4. States and prove De Morgan's law of set theory.

Q5. Write the Principle of Pigeonhole?

Answer Any Four (4x5=20)

Q1. What is binary operation? Explain the closure properties of algebraic system.

Q2. Write the properties of geoups.

Q3. Explain the abelian group with suitable example.

Q4. Explain the group homomorphism with help of suitable example.

Q5. Consider a group of Z_4={[0],[1],[2],[3]} of integer modulo 4. Let H={[0],[2]} be a subgroup of Z_4 under $+_4$.

Answer Any Two (2x10=20)

Q1. Explain the totally ordered set with suitable example.

Q2. What is lattices? Give the properties of lattice.Show that every chain is a lattice.

Q3. Establish de-Morgan's law in complemented, distributed lattice.

Answer Any Two (2x10=20)

Q1. Define tautologies and Show that :

$[(p \vee q) \rightarrow (p \rightarrow r) \leftrightarrow (q \rightarrow r)] \rightarrow r$ is a tautology by constructing truth table.

Q2. What is quantifiers? Explain the rules of quantifiers and take suitable example.

Q3. Construct a table for $(p \leftrightarrow q) \leftrightarrow (r \leftrightarrow s)$ and $(P \leftrightarrow Q)$ a $(P \rightarrow R)$.

Answer Any Two (2x10=20)

Q1. Define the following term-

(1) Simple Graph

(2) self loop

(3) directed graph

(4) in-degree

(5) pendent vertex

Q2. Explain the properties of graph with suitable example.

Q3. State and prove lagrange's theorem.

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