

Seat No.	
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S.E. (Computer Science and Engg.) (Semester - III) (New Course)

Examination, May - 2019

DISCRETE MATHEMATICAL STRUCTURES

Sub. Code : 63525

Day and Date : Tuesday, 14 - 05 - 2019

Total Marks : 50

Time : 09.30 a.m. to 11.30 a.m.

- Instructions :**
- 1) Q.3 and Q.6 are Compulsory from Section - I and Section - II.
 - 2) Attempt any one from Q.1 and Q.2 also any one from Q.4 and Q.5.

SECTION - I

Q1) a) Obtain PDNF of the following without constructing Truth Table [4]

$$P \wedge (P \rightarrow Q)$$

b) Convert following prefix & suffix formulas into completely parenthesized form. [4]

i) $\rightarrow_P PVQ \leftarrow R \neg S$

ii) $\rightarrow \rightarrow PQ \rightarrow \rightarrow QR \rightarrow PR$

c) Write a note on Cartesian Products and Ordered Pairs. [5]

Q2) a) Define with example [4]

i) Proper inclusion

ii) Symmetric difference

b) Let N be the set of natural numbers show that $\langle N, + \rangle$ and $\langle N, \times \rangle$ are monoids. [4]

c) Given $S = \{a_1, a_2, a_3, \dots, a_8\}$ what subsets are represented by B_{17} and B_{31} ? Also how will you designate the subsets $\{a_2, a_6, a_7\}$ and $\{a_1, a_8\}$? [5]

Q3) Write a short note on (Attempt any 3) : [12]

- a) Properties of Binary Relation
- b) Semigroup Homomorphism
- c) Well formed Formula
- d) Partial ordering

P.T.O.

SECTION - II

Q4) a) Define following with respect to Graph. [6]

- i) Path
- ii) Length of path
- iii) Elementary Path

b) Explain PERT with example. [6]

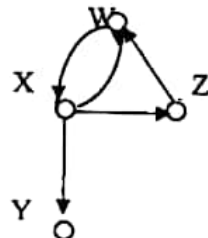
Q5) a) Explain different properties of Lattice. [6]

b) How many number of ways to choose three out of seven days (with repetitions allowed)? How many number of ways to choose seven out of three days (with repetitions necessarily allowed)? [6]

Q6) a) A box contains 6 white balls and 5 black balls find the number of ways 4 balls can be drawn from the box if [6]

- i) Two must be white
- ii) All of them must have the same color

b) Explain Storage representation of following diagram [7]



OR

Write a note on Bays Theorem. [7]

