

Roll No.

24041

**B. Tech 3rd Semester (CS & IT)
Examination – December, 2017**

DISCRETE STRUCTURE

Paper : CSE-203-F

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (i) What is Power Set ?
- (ii) What is Multiset ?
- (iii) What are different properties of monoid ?
- (iv) What is spanning tree ?
- (v) Explain Hamilton Circuit.
- (vi) Explain Multi graph.
- (vii) What is Lagrange's Theorem ?
- (viii) What is Homomorphism ?

SECTION – A

2. (a) Explain the various operations on multiset with example.
(b) On the set of integers Z , the relation aRb iff $a-b$ is multiple of 5, is equivalence relation. Find the equivalence classes.
3. (a) Let $R = \{(1,1), (1,2), (2,2), (2,3), (2,1), (3,1), (3,2)\}$. What is the symmetric closure of R ?
(b) Prove that for any three sets A, B , and C
$$A \times (B \cap C) = (A \times B) \cap (A \times C)$$

SECTION – B

4. (a) How many people among 100 are born in the same month? <http://haryanapapers.com>
(b) Which term is $1/128$ of the sequence 4, 2, 1, ?
5. (a) The product of three consecutive terms of a G.P. is 216 and the sum of their products in pairs is 156. Find the terms.
(b) Solve the following recurrence relation

$$a_n = 6a_{n-1} - 9a_{n-2}, a_0 = 1, a_1 = 6$$

SECTION – C

6. Define monoid, semigroup, group and ring with example.
7. Explain the concept of homomorphism, Isomorphism and automorphism in detail.

SECTION – D

8. Explain the following :
(a) Points and Bridges
(b) Multigraph
(c) Planer graph and graph coloring
9. What do you mean by spanning tree ? Explain the various algorithms for finding the spanning tree.

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