No. of Printed Pages : 03 **Roll No. .....**

304

B. Tech. EXAMINATION, Dec. 2017

(Third Semester)

(Old Scheme) (Re-appear Only)

(CSE)

CSE-203

DISCRETE STRUCTURES

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

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

Note : Attempt any *Five* questions. Answer to the point.

1. Define the following :

(i) Multi Set

(ii) Power Set

(iii) Null Set

(iv) Relation

(v) Function.

Also give their examples. **5×4=20**

2. Draw the truth table for the following :

(i) AND operation

(ii) OR operation

(iii) NOT operation

(iv) $((\sim P \vee Q) \vee P)$

3. How many two digit numbers can be formed using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 with repetition and without repetition of digits ? **20**

4. Solve the following recurrence relation using method of generating functions : **20**

Consider the recurrence relation :

$$a_n = 5a_{n-1} - 6a_{n-2}$$

with initial conditions $a_0 = 1$ and $a_1 = 4$.

5. Write notes on the following :

(i) Subgroup

(ii) Homomorphism

(iii) Isomorphism

(iv) Automorphism. **4×5=20**

6. What is binary tree ? Draw a rooted binary tree and find the height and level of the binary tree you have drawn of your own. **20**

7. What is simple graph ? List its applications. Draw a simple graph with four vertices and also draw a graph having Hamiltonian Path. **20**

8. Write notes on the following : **20**

(i) Cut points and bridges in a graph

(ii) Equivalence Relation.