Printing Page(s) : 1 **Paper Code :DCS-217**

Roll No.

ADCA-12

2nd Year Examination, Academic Batch 2016-17

Discrete Mathematics

Time : 3 Hours] *[Max. Marks : 100*

***Note**. Attempt any **five** questions. Each questions carry equal marks.*

Q.1.(a) Show that inverse of an element a in a group G is unique.
(b) Every subgroup of a cyclic group is cyclic.

Q2. Differentiate between the following with truth table:
(a) Disjunction vs. Conjunction
(b) Conditional vs. Bi- Conditional
(c) Tautology vs. Contradiction:

Q3. (a) Explain "AND, "OR" & NOT operators with logic diagram and truth table.
(b) Define the term 'MINTERM'.
(c) Define the term 'MAXTERM'

Q.4. Let T:v →w be a linear transformation. Then T is onto iff p(T)= dim w.

Q.5. Write short notes on: [any four]
(1) path and circuit (2) Plannar graph (3) Binary tree
(4) Multigraph (5) Tree.

Q.6. Write Short notes on: [Any Four]
(i) Connected graph (ii) regular graph (iii) Weighted graph (iv) Rooted Trees
(v) Sub- graph

Q 7 (a) consider the set M of all 2×2 matrices of the type [x/(-y) y/(-x)] where x',y' are the conjugates of x and y. Is M a field?
(b) Prove that G = { 1,2,3,4,5,6} is a finite abelian group of order 6 under multiplication modulo 7.

Q.8. Explain the application of graph.