

MARWARI COLLEGE RANCHI

Subject : FL & AT

Full Marks : 30

Paper : XVI

Time : 1Hr.

MCA SEMESTER 3

Mid semester examination 2016

GROUP – A

1. Answer all questions of the following: 1 x 10 = 10
- Two sets A and B are if their members are same.
 - A set S with * is called a..... if the Closure, Associativity, Identity element and Inverse are satisfied.
 - For a, b, c in S
 $a \circ (b * c) = (a \circ b) * (a \circ c)$ is called as Property.
 - A relation R in S is if xRx for every x in S.
 - A relation R in S is called Relation if it is reflexive, symmetric, and transitive.
 - A binary tree with 10 vertices has Edges.
 - A binary tree with seven vertices has Leaves.
 - An automation in which the output depends both on inputs and the states of the machine is called
 - The initial state in a transition system is shown by
 - $f : X \rightarrow Y$ is said to be if different elements in X have different images.

GROUP - B

Answer any **TWO** questions:

5 x 2 = 10

- Define Abelian group.
- What is a Relation? Discuss Properties of Relation.
- State and Prove Pigeonhole Principle.
- Differentiate between Deterministic and non-deterministic finite automation.

GROUP - C

Answer any **ONE** question:

10 x 1 = 10

- Describe a finite automation.
- What is a Transition System? Discuss the properties of Transition Function.
- Prove the following Theorem by Induction.
 $1 + 2 + 3 + 4 + \dots + n = n(n+1)/2$