



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.C.A. DEGREE EXAMINATION – COMPUTER APPLICATIONS**

FIRST SEMESTER – NOVEMBER 2017

**CA 1804 - DISCRETE STRUCTURES**

Date: 02-11-2017  
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

**Section – A**

**(10 X 2 == 20 Marks)**

**Answer all Questions**

1. What is biconditional statement. Write the truth table.
2. Define Quantifiers. Write example.
3. What is a function? Give Example.
4. Define Lattice. Write example.
5. Define Combination.
6. What is Binomial coefficient?
7. What is connected graph? Give example.
8. Define Spanning tree.
9. What is Homomorphism?
10. Define a Grammar.

**Section – B**

**(5 X 8 == 40 Marks)**

**Answer all Questions**

- 11 a) Explain with examples the connectives used in the formation of compound statements.  
Or  
b) Write a procedure to find a Principle Conjunctive normal form. Give example.
- 12 a) Discuss about operations on set with example.  
Or  
b) What do you mean by equivalence relation. Explain with an example.
- 13 a) Explain Pigeon hole principle with an example.  
Or  
b) Explain Inclusion and Exclusion with example.
- 14 a) Explain about graph representation with example.  
Or  
b) Discuss in detail about Tree traversal.
- 15 a) Explain Lagrange's theorem.  
Or  
b) Define Grammar. Write its types. Give Example.

**Section – C**

**(2 X 20 == 40 Marks)**

**Answer any TWO Questions**

- 16 a) Explain in detail the following
  - i) Predicates.
  - ii) Quantifiers.

b) Discuss in detail the following with example

- i) Mathematical Induction.
- ii) Strong Induction.

17 a) Explain the following

- i) Binomial coefficients.
- ii) Permutations.

b) Define minimum spanning tree. Explain with an example the Kruskal's algorithm for finding out the minimum spanning tree.

18 a) Discuss in detail the Finite State Machine with output. Give example.

b) Explain the shortest path problem with an Example.

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