Roll No. ..... Total Pages : 2

BT-6/M-20 **36006**

GRAPH THEORY AND COMBINATORICS

Paper–CSE-322

Opt. : (i)

Time : Three Hours] [Maximum Marks : 100

Note : Attempt *five* questions in all, selecting at least *one* question from each unit. All questions carry equal marks.

UNIT–I

1. (a) Explain the following terms with example:

Subgraph, walk, path, tree, spanning tree 10

(b) Describe network flows. 10

2. (a) Explain Euler tours and Hamiltonian cycles with example. 10

(b) Discuss connectivity and separability. 10

UNIT–II

3. (a) Explain vertex coloring and edge coloring. 10

(b) Describe test for planarity. 10

4. (a) Write a short note on graph enumeration. 10

(b) Describe Polya's counting theorem. 10

UNIT–III

5. (a) Explain any *one* shortest path algorithm. 10

(b) Discuss minimum spanning tree. 10

6. (a) Write a short note on depth first search. 10

(b) Explain performance of graph theoretic algorithms. 10

UNIT–IV

7. (a) Explain basic combination numbers. 10

(b) Write a short note on counting principles. 10

8. (a) Discuss Hadamard matrices. 10

(b) Write a short note on finite geometry. 10