

EC I - GRAPH THEORY

UNIT – I

Graphs, subgraphs and Trees: Graphs and simple graphs - Graph Isomorphism - The Incidence and Adjacency Matrices - Subgraphs - Vertex Degrees - Paths and Connection - Cycles - Trees - Cut Edges and Bonds - Cut Vertices

UNIT II

Connectivity, Euler tours and Hamilton Cycles: Connectivity - Blocks - Euler tours – Hamilton Cycles.

UNIT III

Matchings, Edge Colourings : Matchings - Matchings and Coverings in Bipartite Graphs – Edge Chromatic Number - Vizing's Theorem.

UNIT IV

Independent sets and Cliques, Vertex Colourings : Independent sets - Ramsey's Theorem \therefore Chromatic Number - Brooks' Theorem - Chromatic Polynomials.

UNIT V

Planar graphs: Plane and planar Graphs - Dual graphs - Euler's Formula - The Five- Colour Theorem and the Four-Colour Conjecture;

TEXT BOOK(S)

[1] J.A.Bondy and U.S.A. Murthy, Graph Theory and Applications, Macmillan, London, 1976.

UNIT I	Chapter 1 (Section 1.1 - 1.7), Chapter 2 (Section 2.1 - 2.3)
UNIT II	Chapter 3 (Section 3.1 - 3.2), Chapter 4 (Section 4.1 - 4.2)
UNIT III	Chapter 5 (Section 5.1 - 5.2), Chapter 6 (Section 6.1 - 6.2)
UNIT IV	Chapter 7 (Section 7.1 - 7.2), Chapter 8 (Section 8.1 - 8.2, 8.4)
UNIT V	Chapter 9 (Section 9.1 - 9.3, 9.6)

REFERENCE(S)

1. J.Clark and D.A.Holton, A First look at Graph Theory, Allied Publishers, New Delhi, 1995.
2. R. Gould. Graph Theory, Benjamin/Cummings, Menlo Park, 1989.
3. A.Gibbons, Algorithmic Graph Theory, Cambridge University Press, Cambridge, 1989.
4. R.J. Wilson. and J.J.Watkins, Graphs: An Introductory Approach, John Wiley and Sons, New York, 1989.
5. S.A.Choudum, A First Course in Graph Theory, MacMillan India Ltd. 1987.