











## SEC-4: Transportation and Network Flow Problems

### 4 Credits (3 Lectures + 2 Practical per week)

Theory: 75 marks (including internal assessment)

Practical: 25 marks

Transportation problem and its mathematical formulation, northwest-corner method least cost method and Vogel approximation method for determination of starting basic solution, algorithm for solving transportation problem, assignment problem and its mathematical formulation, Hungarian method for solving assignment problem, transshipment problem

Network models, shortest-path problem, minimum spanning tree problem, maximum flow problem, minimum cost flow problem, project network, CPM and PERT

### Practical

#### (Ideal Lab Practical Batch Size: 15-20 Students)

Use TORA/ Excel spreadsheet to solve transportation problem, assignment problem, shortest-path problem, minimum spanning tree problem, maximum flow problem, CPM and PERT calculations of exercises from [1].

Case 8.1: Shipping Wood to Market, and Case 8.3: Project Pickings from [2].

### References:

[1] Hamdy A. Taha, Operations Research, An Introduction, Prentice-Hall, 9th Ed., 2010.

[2] F. S. Hillier and G. J. Lieberman, Introduction to Operations Research-concepts and cases 9th Ed., Tata McGraw Hill, 2010

[3] Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, Linear Programming and Network Flows, 4th Ed., John Wiley and Sons, India, 2010