Atal Bihari Vajpayee Indian Institute of Information Technology & Management, Gwalior

IT305: Optimization Techniques

Major Examination (Session 2023–24)

Maximum Time: 3 Hours **Max Marks: 45**

Note: Answer all questions. Diagrams and detailed steps are mandatory for full credit.

1. (a) Explain the Simplex method in detail with an example. (b) Discuss its advantages over the graphical method. (7 Marks)

2. (a) Solve the following transportation problem using the North-West Corner method:

	$D1$	$D2$	$D3$	*Supply*
$S1$	2	3	1	30
$S2$	5	4	8	50
$S3$	5	6	8	20
Demand	20	40	40	

   (b) Check if the solution is feasible. (8 Marks)

3. (a) Explain the concept of assignment problem. (b) Solve a 3×3 assignment problem using the Hungarian method. (8 Marks)

4. (a) Define non-linear programming. (b) Explain Lagrangian multipliers with an example. (7 Marks)

5. (a) What is game theory? Explain with a two-player zero-sum game example. (b) Discuss its applications in decision-making. (8 Marks)

6. Write short notes on any two: (i) Dynamic programming (ii) Sensitivity analysis in LPP (iii) Multi-objective optimization (7 Marks)