



Semester : 10<sup>th</sup> Sem. IMBA  
Batch : 2020-25  
Subject : Operations Research Applications  
Subject Code : 16IMN1001D

Date : 15.04.2025  
Class Test – II  
Duration : 1 Hr.  
Full Marks : 30

**Section - A**

1. Answer any four out of following questions. [4 x 2 = 8]
- a. List out two management applications of Operations Research. [CO1]
  - b. Name two applications of travelling sales man problem. [CO2]
  - c. Define the term “jockeying” in queuing theory. [CO2]
  - d. What is the bin packing problem? [CO4]
  - e. What is non-linear programming problem? [CO4]

**Section - B**

2. Answer any two questions out of following [2 x 6 = 12]
- a. Consider the following two machines and six job flow shop scheduling problem. Use the Johnson’s algorithm to obtain the optimal sequence which will minimize the make span. [CO2]

Job	Machine-1	Machine-2
1	5	4
2	2	3
3	13	14
4	10	1
5	8	9
6	12	11

- b. Discuss the challenges in solving large-scale integer programming problems. [CO1]
- c. Discuss vehicle routing problem. [CO2]

**Section-C**

3. Answer any one out of following questions. [1 x 10 = 10]
- a. Solve the following NLPP using the Kuhn-Tucker conditions: [CO4]  
Maximize  $Z = 2x_1^2 - 7x_2^2 + 12x_1x_2$   
Subject to;  $2x_1 + 5x_2 \leq 98$   
 $x_1, x_2 \geq 0$
  - b. Discuss the two-stage supply chain distribution problem. How does the performance of the two stages supply chain distribution system impact customer satisfaction and overall profitability? [CO4]