

Subject : Operations Research

Day : Saturday
Date : 10/12/2016



Time : 10.00 AM TO 1.00 PM
Max Marks : 70 Total Pages : 2

N.B.:

- 1) Attempt **ANY THREE** questions from Section – I and attempt **ANY TWO** questions from Section – II.
- 2) Answers to both the sections should be written in the **SAME** answer book.
- 3) Use of non-programmable scientific calculator is **ALLOWED**.
- 4) Figures to the right indicate **FULL** marks.
- 5) Graph papers will be provided if required.

SECTION – I

Q.1 Define Operations Research. Discuss the applications of Operations Research in business [14]

Q.2 A company manufactures two products A and B. These products are processed in the same machine. It takes 10 minutes to process one unit of product A and 2 minutes for each unit of product B and the machine operates for a maximum of 35 hours in a week. Product A requires 1 kg and B requires 0.5 kg of raw material per unit, the supply of which is 600 kg per week. Market constraint on product B is known to be minimum of 800 units every week. Product A costs Rs. 5 per unit and sold at Rs. 10. Product B costs Rs. 6 per unit and can be sold in the market at a unit price of Rs. 8. Determine the number of units of A and B per week to maximize the profit. [14]

Q.3 Given the following transportation table, find the initial basic feasible solution by North-West Corner Rule. [14]

	D ₁	D ₂	D ₃	D ₄	Supply
O ₁	7	4	6	5	14
O ₂	9	9	2	8	16
O ₃	5	8	7	2	15
Required	6	20	15	4	

Also, check whether the above solution is optimal or not?

Q.4 Given the following information: [14]

Number of cars arriving	0	1	2	3	4	5
Probability	0.21	0.32	0.28	0.12	0.05	0.02

Simulate the arrival of the cars for the next 20 arrivals using the following random number: 64, 15, 26, 89, 78, 69, 44, 39, 27, 18, 16, 92, 87, 65, 18, 25, 48, 36, 83, 69. Find the average rate of car-arrivals.

Q.5 Write short notes on **ANY TWO** of the following: [14]

- a) Uses of Simulation
- b) Importance of PERT
- c) Least Cost Method

P.T.O.