

00655

MANAGEMENT PROGRAMME

Term-End Examination

December, 2016

MS-051 : OPERATIONS RESEARCH

Time : 3 hours

Maximum Marks : 100

(Weightage 70%)

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- Note :** (i) *Attempt any four questions.*
(ii) *All questions carry equal marks.*
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1. (a) "Operations Research is an aid for the executive in making his/her decisions by providing him/her with needed quantitative information based on the scientific method of analysis". Discuss the statement and give examples to demonstrate how Operations Research is helpful in decision making.
- (b) Define the following terms :
Slack variables, Basic variables, Surplus variables.

2. (a) Solve the following problem by graphical method.

Subject to

$$2x_1 - 6x_2 \leq 0$$

$$-x_1 + 2x_2 \geq -2$$

$$-3x_1 - 3x_2 \geq -24$$

$$x_1 \geq 2$$

$$x_2 \geq 0$$

(i) Minimise $10x_1 - 4x_2$

(ii) Maximise $10x_1 - 4x_2$

- (b) Explain the Vogel Approximation Method (VAM) for finding the basic feasible solution of a Transportation problem.

3. (a) Discuss various steps in Goal Programming Model Formulation. How does Goal programming help in decision making ?

- (b) Explain the Branch and Bound method for solving an Integer Programming Problem.

4. (a) Discuss the classification of Inventory on the basis of service aspect.

- (b) A foreign bank is considering opening a drive-in-window for customer service. Management estimates that customer will arrive for service at the rate of 12 per hour. The teller, whom it is considering to staff the window, can serve customers at the rate of one every three minutes. Assuming Poisson arrivals and exponential service. Find :

- (i) Utilisation of teller.
- (ii) Average number in the system.
- (iii) Average waiting time in the line.
- (iv) Average waiting time in the system.

5. (a) Explain the concept of Dominance in context of Game Theory.
- (b) For the following two persons, zero sum game, find the optimal strategies for the two players and value of the game :

		Player B		
		B ₁	B ₂	B ₃
Player A	A ₁	5	9	3
	A ₂	6	-12	-11
	A ₃	8	16	10

If saddle point exists, determine it using the principle of dominance.

6. Write short notes on any four of the following :
- (a) ABC Analysis
 - (b) Degeneracy in LP problem
 - (c) FIFO & LIFO
 - (d) Poisson Process
 - (e) Buffer stock
 - (f) Separable programming