

2M5108

Roll No. _____

Total No of Pages: **3****2M5108****M. B. A. II Sem. (Main / Back) Exam., June-July 2016
M-208 A Operations Research****Time: 3 Hours****Maximum Marks: 70
Min. Passing Marks: 28***Instructions to Candidates:*

- (i) *The question paper is divided in two sections.*
- (ii) *There are sections A & B. Section A contains 6 questions out of which the candidate is required to attempt any 4 questions. Section B contains short case study / application based question which is compulsory.*
- (iii) *All questions carry equal marks.*

SECTION – A

- Q. 1 (a) Define Operation Research and discuss its advantages and disadvantages. [7]
(b) Write an essay on scope and methodologies of operations research. [7]
- Q. 2 (a) How do the graphic and simplex method of solving linear programming problem differ? In what ways they are same. [7]
(b) What are shadow prices and why they are important? How they are determined? What is the relationship to the dual problem? [7]
- Q. 3 A company has four factories F_1, F_2, F_3 and F_4 manufacturing the same product. Production and raw material costs differ from factory to factory and are given in the following table in the first two rows. The transportation costs from the factories to the sales depots S_1, S_2, S_3 are also given. The last two columns in the table give the sales price and the total requirement at each depot. The production capacity of each factory is given in the last row.

	F ₁	F ₂	F ₃	F ₄	Sales Price Per Unit	Requirement	
Production Cost/Unit	15	18	14	13			
Raw Material Cost/Unit	10	9	12	9			
Transportation Cost/Unit	S ₁	3	9	5	4	34	80
	S ₂	1	7	4	5	32	120
	S ₃	5	8	3	6	31	150
Supply	10	150	50	100			

Determine the most profitable production and distribution schedule and the corresponding profit. The deficit production should be taken to yield zero profit. [14]

Q. 4 Two breakfast food manufacturing firms A and B are competing for an increased market share. To improve its market share, both the firms decide to launch the following strategies:

A₁, B₁ = Give coupons

A₂, B₂ = Decrease piece

A₃, B₃ = Maintain present strategy

A₄, B₄ = Increase advertising

The pay-off matrix, shown in the following table describes the increase in market share for firm A and decrease in market share for firm B. [14]

		FIRM B			
		B ₁	B ₂	B ₃	B ₄
FIRM A	A ₁	35	35	25	5
	A ₂	30	20	15	0
	A ₃	40	50	0	10
	A ₄	55	60	10	15

Determine the optimal strategies for each firm and value of the same.

- Q. 5 (a) "PERT provides the framework with which a project can be described, scheduled and controlled." Discuss. [7]
- (b) What is meant by crashing of projects time? Explain the steps involved in planning. [7]
- Q. 6 Define simulation. Discuss its process, advantages and disadvantages. [14]

SECTION – B

Case Study

- Q. 7 The data for a PERT network is displayed below. Determine the critical path, ET, LT and expected duration (T_e) for completing the entire project. [14]

Activity	t_o	t_M	t_p
1-2	2	4	6
1-3	6	6	6
1-4	6	12	24
2-3	2	5	8
2-5	11	14	23
3-4	15	24	45
3-6	3	6	9
4-6	9	15	27
5-6	4	10	16

Answer the following:-

- (a) What is the probability that project duration will exceed 60 days:-

given : Z	0.25	0.50	0.75	1.00	1.50	1.67
	0.599	0.692	0.778	0.841	0.933	0.953