

Seat No. : _____

XB-117

T.Y.BBA

March-2013

MPOM

Time : 3 Hours]

[Max. Marks : 70

Instruction: Please tie Section- I and Section – II separately.

SECTION – I

1. (a) Write short notes on scope of Operation Research. **4**

(b) Solve the following LPP by simplex method : **7**

$$\text{Maximize } Z = 10x_1 + 6x_2 + 4x_3$$

Subject to Constraint

$$x_1 + x_2 + x_3 \leq 100$$

$$10x_1 + 4x_2 + 5x_3 \leq 600$$

$$2x_1 + 2x_2 + 6x_3 \leq 300$$

$$x_1, x_2, x_3 \geq 0.$$

OR

(a) Define the following : **4**

(1) Surplus variable

(2) Degenerate variable

(3) Solution

(4) Objective function

(b) A firm has an advertising budget of ₹ 80,000. It wishes to allocate this budget to media television and magazines, so that total exposure is maximized. Each advertisement on television reaches to 6,000 exposure whereas each advertisement in magazine reaches 1200 exposures. Each advertisement on television costs ₹ 2,000 and that of magazine costs ₹ 1,000. The firm wishes to give at least 10 advertisements on television and atleast 20 advertisements in magazines. Determine the optimal media-mix for this firm. **7**

2. (a) Write short note on Hungarian Method. 4
 (b) Solve the following transportation problem. Find initial basic feasible solution and also find optimum transportation problem. 8

Factories	Depots					Tones available
	A	B	C	D	E	
P	4	1	3	4	4	60
Q	2	3	2	2	3	35
R	3	5	2	4	4	40
Tone Required	22	45	20	18	30	135

OR

- (a) Convert the following problem into Dual : 4
 Min $Z = 12x_1 + 8x_2$
 Subject to $2x_1 + 4x_2 \leq 10$
 $3x_1 + 2x_2 \geq 60$
 $x_1, x_2 \geq 0$.
- (b) The MBI manufacturing company plans to manufacture 4 types new minicomputers. Each of the plant has manufacturing capacity for one product only. The unit manufacturing cost for producing the different minicomputers at the four plants are shown in table below. What is the lowest total manufacturing cost ? 8

Minicomputers Type

Plants	1	2	3	4
1	24	18	22	28
2	28	20	16	24
3	16	28	20	24
4	22	32	24	22

3. (a) What is inventory ? What are the cost associated with inventory ? 4
 (b) The utility data for a network are given below. Determine the total, free, independent float and identify the critical path : 8

Activity :	0 – 1	1 – 2	1 – 3	2 – 4	2 – 5	3 – 4	3 – 6	4 – 7	5 – 7	6 – 7
Duration :	2	8	10	6	3	3	7	5	2	8

OR

- (a) Define the following : 4
 (1) PERT
 (2) Event
 (3) Activity
 (4) Float
- (b) A company uses ₹ 10,000 worth of an item during the year. The ordering costs are ₹ 25 per order and holding charges are ₹ 0.125 per unit per year. Find the economic order quantity, number of orders per year, time period per order and the total cost. 8

SECTION – II

1. Define production and operations management. Discuss the nature and scope of production and operations management. **8**

OR

Define work study. Discuss the objectives and steps of work study.

2. (a) Elaborate principles of motion economy. **7**
(b) Define plant location. Discuss the factors affecting plant location. **8**

OR

Define purchasing. Briefly explain the various purchasing policies.

3. Write short notes on any **two** : **12**
- (a) Types of plant layout
 - (b) Therbligs
 - (c) Methods of Inventory Control
 - (d) Factors affecting productivity
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