Lib 25/5/17 – Ish

Printed Pages : 2 Roll No. | | | | | | | | | | | RMB207

M.B.A.

THEORY EXAMINATION (SEM–II) 2016-17

QUANTITATIVE TECHNIQUES FOR MANAGERS

Time : 3 Hours *Max. Marks : 70*

Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.

SECTION – A

1. Explain the following: **7 x 2 = 14**

(a) What is operations research?

(b) What is the difference between decision making under risk and uncertainty?

(c) What do you mean by balanced assignment problem?

(d) Define transportation problem.

(e) What is two person zero sum game?

(f) Explain group replacement policy.

(g) What is the importance of dummy activity in network diagram?

SECTION – B

2. Attempt any five of the following questions: **5 x 7 = 35**

(a) Solve the following minimal assignment problem whose effectiveness matrix is as below:

Man \ Job	I	II	III	IV
A	2	35	4	5
B	4	5	6	7
C	7	8	9	8
D	3	5	8	4

(b) Find the optimal solution for transporting the products at a minimum cost for the following transportation problem with cost structures as follows:

To → / From ↓	P	Q	R	Availability
A	16	19	12	14
B	22	13	19	16
C	14	28	8	12
Requirement	10	15	17	42

(c) Solve the following L.P.P. by graphical method

Max $z = 22x_1 + 18x_2$

Subject to,

$360x_1 + 240x_2 \leq 5760$

$x_1 + x_2 \leq 20.$ Where $x_1, x_2 \geq 0$

(d) Explain the maximin – minimax principle of game theory.

(e) We have five jobs, each of which must go through the machines A, B and C in the order ABC.

Job i	1	2	3	4	5
Machine A (Ai)	5	7	6	9	5
Machine B (Bi)	2	1	4	5	3
Machine C (Ci)	3	7	5	6	7

Determine a sequence for the jobs that will minimize the total elapsed time. Also calculate the total elapsed time.

(f) Solve the following game whose pay-off matrix is given by:

		Player B			
		I	II	III	IV
Player A	I	3	2	4	0
	II	2	4	2	4
	III	4	2	4	0
	IV	0	4	0	8

(g) What is the waiting lime problem? Also discuss the assumption underlying common queuing models.

(h) The maintenance cost and resale value per year of a machine whose purchase price is Rs. 7000 is given below.

Year	1	2	3	4	5	6	7	8
Operating Cost (Rs.)	900	1200	1600	2100	2800	3700	4700	5900
Resale Value (Rs.0	4000	2000	1200	600	500	400	400	400

When should the machine be replaced?

SECTION – C

Attempt any two of the following questions: **2 x 10.5 = 21**

3. Solve the following L.P.P.

Max. $z = 5x_1 + 10x_2 + 8x_3$

Subject to

$$3x_1 + 5x_2 + 2x_3 \leq 60$$
$$4x_1 + 4x_2 + 4x_3 \leq 72$$
$$2x_1 + 4x_2 + 5x_3 \leq 100$$

Where $x_1, x_2, x_3 \geq 0$

4. If you make a unit product and it is sold you gain Rs. 5, if you make a unit and it is not sold you loose Rs. 3, suppose the probability distribution of the number of units demanded is as follows- How many units should you make?

No. of units demanded	1	2	3	4	5
Probability	0.20	0.25	0.30	0.05	0

5. Activity predecessor time estimate (in weeks) of a PERT network are as follow

Activity	Predecessor Activity	to	tm	tp
A	--	2	3	10
B	--	2	3	4
C	A	1	2	3
D	A	4	6	14
E	B	4	5	12
F	C	3	4	5
G	D, E	1	1	7

(a) Draw the network and identify the critical path.

(b) Calculate the variance and standard deviation of the project.