214403

May, 2019

BBA - II SEMESTER

QUANTITATIVE TECHNIQUES (BBA/II/403)

Time : 3 Hours]   [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*

2. *Answer any four questions from Part-B in detail.*

3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART–A

1. (a) What is the Significance of Operations Research?

    (1.5)

    (b) Explain Infeasible solution in Linear programming.

    (1.5)

    (c) What is Unbalanced Problem in Transportation Problem?   (1.5)

    (d) What is difference between PERT and CPM? (1.5)

(e) What is meant by float? (1.5)

(f) What is dummy activity in network construction. (1.5)

(g) What is difference between pure and mixed strategies in game theory? (1.5)

(h) Explain multiple optimal solution in transportation problem. (1.5)

(i) Define saddle point in game theory. (1.5)

(j) What is rule of dominance? (1.5)

PART-B

2. (a) What do you mean by Operations Research? Discuss its scope as well as limitations. (10)

(b) Explain Graphical Method of Linear Programming Problem. (5)

3. (a) Solve the Linear Programming graphically

$Z(max) = 20x_1 + 40x_2$

Subject to constraints

$36x_1 + 6x_2 \geq 108$

$3x_1 + 12x_2 \geq 36$

$20x_1 + 10x_2 \geq 36$

$x_i \geq 0, \quad x_2 \geq 0.$ (5)

(b) There are 4 Jobs A, B, C, D and these are performed on four machine centres I, II, III and IV. One job is to be assigned to machine centre. Each machine is capable of doing any job at different costs given by matrix below :

	Machine Centres			
Job	I	II	III	IV
A	1	2	3	4
B	3	5	9	13
C	17	25	33	43
D	51	61	72	87

(10)

4. A manufacturer wants to ship loads of his product as shown below. The matrix gives the Kilometers from sources of supply to destination

	D1	D2	D3	D4	D5	Supply
S1	5	8	6	6	3	8
S2	4	7	7	6	5	5
S3	8	4	6	6	4	9
Demand	4	4	5	4	8	

What is the shipping schedule to minimize total transportation cost. (15)

[P.T.O.

5. A traveling Salesman has to visit 5 cities he wishes to start from a city once and then return to starting point. Cost of going from one city to another is shown below. Find least route

		To Cities			
		A	B	C	D	E
	A	M	4	7	3	4
	B	4	M	6	3	4
From Cites	C	7	6	M	7	5
	D	3	3	7	M	7
	E	4	4	5	7	M

(15)

6. (a) Solve the game graphically and find the value of game

		Player B	
	B1	B2	B3
A1	8	4	−2
A2	−2	−1	3

(5)

(b) Explain the characteristics of Queuing System. (10)

7. There is toll arrangement in newly opened bridge on a highway system. There is only one attendant at toll gate. Vehicles arrive at toll gate at the rate of 120 vehicles per hour and it takes the attendant on an average 15 seconds to attend a car. Arrivals are passion whereas service times are exponentially distributed. Find out

(a) proportion of time server is busy

(b) probability that the system will have no vehicles

(c) Expected no. of vehicles in the system

(d) Expected no. of vehicles waiting to be served in the system

(15)