

2012  
Bachelor of Business Administration  
Third Semester  
BBA-202: Operation Research

Time allowed: 3 Hours

Max. Marks: 80

**NOTE:** Attempt four short answer type questions from Section-A. Attempt two questions each from Section B and C respectively.

x-x-x

**Section – A**

1. A company is producing two type of cycles i.e. cycle A and cycle B. It sells them at a profit of Rs 1200 and Rs 1300 for cycle A and B respectively. Each cycle is processed on two machines G and H. Type A requires one hour of processing on machine G and two hours of processing on machine H. Type B requires one hour of processing on machine G and one hours of processing on machine H. Machine G is available for not more than 6 hours while machine H is available for not more than 10 hours. Formulate the LPP to maximize the profit.

2. Find out IBFS for the following transportation problem by LCEM

	1	2	3	4	Supply
A	7	3	8	6	60
B	4	2	5	10	80
C	2	6	5	1	40
demand	20	50	50	80	

3. A production manager wants to assign one of the five new methods to each of the four operations. The following table summarizes the weekly output in units.

Operator	Weekly Output				
	M1	M2	M3	M4	M5
A	4	6	11	16	9
B	5	8	16	19	9
C	9	13	21	21	13
D	6	6	9	11	7

Cost per unit is Rs 20, selling price per unit is Rs 30. Find the maximum profit per month.

4. Solve the following game by odds method

		Y	
		Y1	Y2
X	X1	1	0
	X2	-4	3

5. Write short note on zero sum game.  
6. Explain the objectives of operations research.

(4x5)

P.T.O.

(2)

Section - B

7. A firm makes two types of furniture i.e. chairs and tables. The contributions for each product as calculated by accounting department are Rs 20 per chair and Rs 30 per table. Both products are processed on three machines M1, M2 and M3. The time required by each product and total time available per week on each machine are as follows:

Machine	Chair	Table	Available time (in hours)
M1	3	3	36
M2	5	2	50
M3	2	6	60

Using simplex method determine how should the manufacturer schedule his production in order to maximize contribution?

8. A company has three plants at locations A, B and C which supply to warehouses located at D, E, F, G and H. monthly plant capacities are 800, 500 and 900 units respectively. Monthly warehouse requirements are 400, 400, 500, 400 and 800 units respectively. Unit transportation costs (in Rs ) are given below:

	To				
	D	E	F	G	H
From A	5	8	6	6	3
From B	4	7	7	6	6
From C	8	4	6	6	4

Determine an optimum distribution for the company in order to minimize the total transportation cost.

9. A company has four vehicles to be run on four routes. The distance (in kms) for each route and the kms run litre of diesel for each vehicle in each of the routes are given below. Drivers are associated with the trucks.

	Kms per litre in the route of			
	I	II	III	IV
Vehicle A	4.0	5.0	5.0	3.0
Vehicle B	4.5	6.0	5.0	3.5
Vehicle C	5.0	5.5	6.0	4.0
Vehicle D	4.8	5.8	5.5	3.0
Distance covered per day in kms	200	300	250	150

Which vehicle should be assigned to which route in order to minimize the total consumption of diesel by all the four vehicles?

10. Define operations research. Explain the scope and significance of operations research.

(2x15)

(3)

Section - C

11. There are eight activities in a project having following characteristics:

Time estimates in weeks

Activity	Preceding activity	Most optimistic time	Most likely time	Most pessimistic time
A	None	2	4	12
B	None	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B,C	9	9	9
G	D	3	3.5	7
H	E,F,G	5	5	5

- Draw the PERT network for the project
- Prepare the activity schedule for the project.
- Determine the critical path.

12. Use graphic method to solve the following game

		Player Y				
		I	II	III	IV	V
Player X	I	6	3	-1	0	-3
	II	3	2	-4	2	-1

13. A ready-made garments manufacturer has to process five items through 2 stages of production, viz. cutting and sewing. The time taken for each of these items at the different stages is given below (in hours):

	item	1	2	3	4	5
Processing time in hours	Cutting	5	7	3	4	6
	Sewing	2	6	7	5	9

Find an order in which these items should be processed so as to minimise the total processing time. Also calculate the various idle times.

14. Differentiate between PERT and CPM. Explain different type of floats.

(2x15)