Exam. Code : 105404
Subject Code : 1383

Bachelor in Business Administration 4th Semester

OPERATIONS RESEARCH

Paper—BBA-406

Time Allowed—2 Hours] [Maximum Marks—50

Note :— There are ***eight*** questions of equal marks. Candidates are required to attempt any ***four*** questions.

1. Discuss the concept of operations research. Explain its scope and importance in business.

2. (a) Solve following LPP using Simplex method :

Maximize $Z = 10x_1 + 20x_2$

Subject to : $3x_1 + 2x_2 \geq 18$

$x_1 + 3x_2 \geq 8$

$2x_1 - x_2 \leq 6$

$x_1, x_2 \geq 0$

(b) Following information is relating to a component manufacturing company :

Demand = 2000 units

Cost = Rs. 50 per unit

Carrying cost = 20%

Ordering cost = Rs. 25 per order

Calculate :

(i) EOQ

(ii) Total Annual Cost

3. Solve following Transportation Problem to find optimal solution :

	W_1	W_2	W_3	W_4	Supplies
F_1	48	60	56	58	140
F_2	45	55	53	60	260
F_3	50	65	60	62	360
Demand	200	320	250	210	

4. Time taken (in minutes) by different employees for performing different jobs have been shown in the following table :

JOBS

Employees	S_1	S_2	S_3	S_4	S_5
A	85	75	65	125	75
B	90	78	66	132	78
C	75	66	57	114	69
D	80	72	60	120	72
E	76	64	56	112	68

Obtain the optimal assignment and the total time taken.

5. Draw a network from the following activities and find critical path and total duration of project :

Activity	Duration (Days)	Activity	Duration (Days)
1-2	9	5-6	8
1-4	4	5-7	9
1-3	7	5-8	10
2-5	7	6-7	6
3-4(Dummy)	0	7-9	10
3-6	5	8-9	2
4-6	8		

6. (a) Define game theory. Discuss applications of game theory.

(b) Solve following game and determine optimal strategies :

	B_1	B_2	B_3
A_1	5	9	3
A_2	6	–12	–1
A_3	8	16	10

7. (a) Find the optimal strategies for A and B in the following game. Also obtain the value of the game.

		B's Strategy		
		b_1	b_2	b_3
A's Strategy	a_1	9	8	–7
	a_2	3	–6	4
	a_3	6	7	–7

(b) Find the optimal strategies for A and B in the following game. Also obtain the value of the game.

		B's Strategy		
		b_1	b_2	b_3
A's Strategy	a_1	12	–8	–2
	a_2	6	7	3
	a_3	–10	2	2

8. (a) Explain process of crashing in project.

(b) Draw a network from the following activities and find critical path and total duration of project :

Activity	Duration (Days)	Activity	Duration (Days)
1-2	4	3-5	7
1-3	7	4-5(Dummy)	0
1-4	6	5-6	5
2-3(Dummy)	0	5-7	6
3-4	5	6-7(Dummy)	0