



MBA & MBA (Finance) II Semester Regular Examinations June/July 2018

OPERATIONS RESEARCH

(For students admitted in 2017 only)

Time: 3 hours

Max. Marks: 60

SECTION – A

(Answer the following: (05 X 10 = 50 Marks))

- 1 Explain the procedure to solve LPP in detail.

OR

- 2 Solve the following LPP:

$$\text{Max } z = 3x_1 + 5x_2$$

$$\text{Subject to constraints: } 3x_1 + 2x_2 \leq 12$$

$$x_1 + x_2 \leq 5$$

$$x_1, x_2 \geq 0$$

- 3 Solve the following transportation problem:

Origin	Destination				Availability
	A	B	C	D	
O ₁	6	4	1	5	14
O ₂	8	9	2	7	16
O ₃	4	3	6	2	5
Requirement	6	10	15	4	35

OR

- 4 A company has five jobs to be done. The following matrix shows the profit in rupees on assigning the machines A, B, C, D and E to the jobs P, Q, R, S and T. Assign the jobs to the machines so as to maximize the expected profit.

Machines	Jobs				
	P	Q	R	S	T
A	5	11	10	12	4
B	2	4	6	3	5
C	3	12	5	14	6
D	6	14	4	11	7
E	7	9	8	12	5

- 5 Describe Jonson's procedure for determination an optimal sequence for processing n items on two machines. Give justification of the rule used in the procedure.

OR

- 6 There are six jobs each of which must go through the machines A and B in the order AB.

	P	Q	R	S	T	U
A	8	4	1	9	11	14
B	1	5	2	7	10	6

Determine the sequence for the jobs that will minimize the total elapsed time and idle time for each machine.

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- 7 Two firms A and B are competing for an increased market share. To improve the market share, both the firms decide to employ the following promotional strategies.

	B ₁	B ₂	B ₃
A ₁	5	20	-10
A ₂	10	6	2
A ₃	20	15	18

Determine the optimal strategies for each firm and also the value of the game.

OR

- 8 A soft drink company calculated the market share of two products against its major competitor having three products and found out the impact of additional advertisement in any one of the product against the other. The pay-off matrix is given as follows:

Company / Competitor	1	2	3
1	6	7	15
2	20	12	10

Find value of the game and also strategies.

- 9 Distinguish between CPM and PERT. Explain various applications of CPM and PERT.

OR

- 10 Draw the network and determine the critical path for the following data.

Activity	1-2	1-3	2-3	2-4	3-4	3-5	4-5	4-6	5-6
Time (days)	12	11	5	21	18	8	14	23	17

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

- 11 **Case Study:**

The Regal China Company produces two products daily, i.e. plates and mugs. The company has limited amounts of two resources clay and labor used in the production. Given these limited resources, the company desires to know how many plates and mugs are to be produced each day, in order to maximize profit. The two products have the following resource requirements for production and profit per item produced.

Product	Labour (hours per unit)	Clay (kgs per unit)	Profit (Rs. per unit)
Plate	1	4	4
Mug	2	3	5
