Code: 14E00205

MBA II Semester Supplementary Examinations June/July 2018
OPERATIONS RESEARCH
(For students admitted in 2014, 2015 & 2016 only)

Time: 3 hours   Max. Marks: 60

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

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1   Describe the relationship between quantitative analyst and the manager.

OR

2   Solve the following LPP using graphical method:
     Max $z = 4x_1 + 5x_2$
     Subject to constraints: $5x_1 + x_2 <= 20$
     $x_1 + 5x_2 <= 20$
     $x_1, x_2 >= 0$

3   Find the initial feasible solution for the following transportation problem using any two methods and compare the cost of transportation. The products are to be transported from three factories to three market destinations. The cost of transportation in Rs. per unit is given in the matrix. The demand and supply in '000 units is also given in the matrix.

	D1	D2	D3	Supply capacity
F1	9	10	5	200
F2	4	12	15	100
F3	8	25	20	50
Demand	150	125	75	

OR

4   Four jobs are to be allotted to a worker each. Five workers are available and each worker's cost of doing the job (in Rs. '000) are as shown in the matrix below. Choose the right worker for the right job.

	J1	J2	J3	J4
W1	5	6	8	2
W2	3	7	9	11
W3	8	7	3	11
W4	11	9	7	5
W5	12	6	8	9

5   Five jobs have to be sequenced on two machines to minimize the total throughput time. The process for each job is to first complete the work on machine 1 and then on machine 2. No machine can do multitasking. Decide the sequence of the jobs for optimum total finish time. Show the start and finish times for each of the jobs.

	J1	J2	J3	J4	J5
Machine 1	2	6	10	13	4
Machine 2	12	7	4	6	8

OR

6   Explain the principles of game theory. What is an unfair game? Explain the concept of saddle point. What is the approach if saddle point is not present in a game?

7   Explain the assumptions involved in waiting lines theory.

OR

8   A certain bank has 40 customers arriving every hour on an average following Poisson distribution. It takes the cash counter an average of 1 minute to service each customer, following exponential distribution. Compute the average waiting time of a customer in the bank and the queue. Also compute the average queue size and the number of people inside the bank at any given point of time.

9   A certain transport company has the following resale value for a truck which costs Rs.400,000 over a period of 7 years. The running costs are also given. Decide after how many years the firm should consider buying a new truck.

	1	2	3	4	5	6	7
Value	350,000	300,000	200,000	100,000	50,000	50,000	50,000
Running cost	50,000	70,000	90,000	130,000	150,000	170,000	190,000

OR

10   Explain the rules for drawing a network diagram. What is the critical path and what is its significance? What is float, where is it useful? What is crashing and why is it done?

SECTION – B
(Compulsory question, 01 X 10 = 10 Marks)

11   **Case Study:**

A firm is considering three products A, B and C. The firm can produce a maximum of 1000 units of A, 500 units of B and 350 units of C. The profitability per unit product is Rs.10 for A, Rs.20 for B and Rs.40 for C. The firm can produce a combined total of 1300 units of all three products. Formulate the linear programming problem to maximize the profitability and solve it using Simplex method.

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