Code No. 12012

FACULTY OF MANAGEMENT

M.B.A. III – Semester (CBCS) Examination, December 2019

Subject: Operations Research

Paper – MB – 303

Time: 3 Hours

Max.Marks: 80

Note: Answer all the questions from Part-A and Part-B.
Each question carries 4 marks in Part-A and 12 marks in Part-B.

PART – A (5x4 = 20 Marks)
[Short Answer Type]

Note: Answer all the questions in not more than one page each.

1   Modelling in OR

2   Slack Variable

3   Degeneracy in Transportation Problem

4   Burst Event

5   Reneging

PART – B (5x12 = 60 Marks)
[Essay Answer Type]

Note: Answer all the questions by using internal choice in not exceeding 4 pages each.

6   a) What is Operations Research? Explain briefly its applications.

OR

   b) Solve the following graphically:
   Max $Z = 5x_1 + 3x_2$
   Subject to Constraints: $2x_1 + x_2 \leq 1000$
   $$x_1 \leq 400$$
   $$x_2 \leq 700$$
   $$x_1, x_2 \geq 0$$

7   a) What is Linear Programming? What are the assumptions in formulating Linear Programming Problem? What are the major Limitations?

OR

   b) Use Dual and solve the following:
   Min $Z = 40x_1 + 200x_2$
   Subject to Constraints: $4x_1 + 40x_2 \geq 160$
   $$3x_1 + 10x_2 \leq 60$$
   $$8x_1 + 10x_2 \geq 80$$
   $$x_1, x_2 \geq 0$$

8   a) Explain the North West Corner method of solving a transportation problem.

OR

b) Solve the following Assignment Problem and find the optimal solution.

		Machines			
		M_1	M_2	M_3	M_4
Jobs	J_1	5	7	11	6
	J_2	8	5	9	6
	J_3	4	7	10	7
	J_4	10	4	8	3

9 a) Explain the term crashing and resource leveling in network analysis.

OR

b) The characteristics of a project schedule are given below:

Activity	Time (Days)	Activity	Time (Days)
1-2	4	5-6	4
1-3	1	5-7	8
2-4	1	6-8	1
3-4	1	7-8	2
3-5	6	8-10	5
4-9	5	9-10	7

1) Draw the Network
2) Compute the Earliest and Latest Times
3) Compute the Total Float and Free Float.

10 a) Explain the following:
   i) Saddle Point
   ii) Dominance Principle

OR

b) Students arrive at the head office of Universal Teacher Publications according to a Poisson input process with a mean rate of 40 per hour. The time required to serve a student has an exponential distribution with a mean of 50 per hour. Assume that the students are served by a single individual; find
   1) The average waiting time of a student
   2) What would be the average queue length?
   3) What would be the average number of customers in the queuing system?

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