

FACULTY OF MANAGEMENT

M.B.A. III – Semester (CBCS) Examination, January 2018

Subject : Operations Research

Paper – MB-303

Time : 3 hours

Max. Marks : 80

PART – A (5 x 4 = 20 Marks)
(Short Answer Type)

- 1 Linear programming
- 2 Sensitivity analysis
- 3 Modi Method
- 4 PERT
- 5 Zero sum game

PART – B (5 x 12 = 60 Marks)
(Essay Answer Type)

- 6 a) Discuss the significance and scope of operations research in modern management.

OR

- b) Explain the phases of OR.

- 7 a) Explain the application areas of LPP.

OR

- b) Solve the following LPP by graphical method.

$$\begin{aligned} \text{Maximize } Z &= 25x_1 + 20x_2 \\ \text{Subject to } &16x_1 + 12x_2 \leq 100 \\ &8x_1 + 16x_2 \leq 80 \\ &x_1, x_2 \geq 0 \end{aligned}$$

- 8 a) Distinguish between transportation problem and assignment problem. Explain.

OR

- b) A department head has four tasks to be performed and three subordinates. The subordinates differ in efficiency. The estimated time, each subordinate would take to perform, is given below. How should he allocate the tasks, one each man, so as to minimize the total man-hours?

| | Men | | |
|-------|-----|----|----|
| Tasks | 9 | 26 | 15 |
| | 13 | 27 | 6 |
| | 35 | 20 | 15 |
| | 18 | 20 | 20 |

9 a) What is PERT? Discuss the time cost trade off in project crashing.

OR

b) A project has the following activities and other characteristics.

| Activity | Preceding activity | Time estimates (in weeks) | | |
|----------|--------------------|---------------------------|-------------|-------------|
| | | Optimistic | Most likely | Pessimistic |
| A | --- | 4 | 7 | 16 |
| B | --- | 1 | 5 | 15 |
| C | A | 6 | 12 | 30 |
| D | A | 2 | 5 | 8 |
| E | C | 5 | 11 | 17 |
| F | D | 3 | 6 | 15 |
| G | B | 3 | 9 | 27 |
| H | E,F | 1 | 4 | 7 |
| I | G | 4 | 19 | 28 |

i) Draw the network diagram and find the critical path.

ii) Find the probability that the project is completed in 36 weeks.

10 a) Explain the characteristics of the queuing system. Discuss the fields of application for queuing theory.

OR

b) The following is the pay-off matrix of 3 x 3. Solve the game and state value of the game with suitable strategies mix.

| A's strategy | B's strategy | | |
|--------------|--------------|----|----|
| | b1 | b2 | b3 |
| a1 | 12 | -8 | -2 |
| a2 | 6 | 7 | -3 |
| a3 | -10 | -6 | 2 |
