

CDOE
MASTER OF BUSINESS ADMINISTRATION (EXECUTIVE) (CBCS-2020 COURSE)
M.B.A. (E) SEM - III : WINTER :- 2021
SUBJECT: OPERATIONS RESEARCH FOR MANAGERS

Day : Thursday
Date 17-02-2022

W-23803-2021

Time : 10:00 AM-12:00 PM
Max. Marks: 50

N.B.:

- 1) Attempt **ANY THREE** questions from Section – I and **ANY TWO** questions from Section – II.
- 2) Answers to both the section should be written in **SAME** answer book.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Use graph paper **WHEREVER** necessary.
- 5) Figures to the right indicate **FULL** marks.

SECTION – I

Q.1 Define Operations Research. Explain the features of Operations Research. **[10]**

Q.2 Solve the following L.P.P. graphically: **[10]**

$$\text{Max } Z = 3x + 4y$$

$$\text{Subject to : } 4x + 2y \leq 80$$

$$2x + 5y \leq 180$$

$$x, y \geq 0$$

Q.3 Find the I.B.F.S., of the following transportation problem by **[10]**

- a) North-West Corner Method (NWCM)
- b) Least-Cost Method (LCM)

| Sources | Destinations | | | | Capacity |
|---------|--------------|----|----|----|----------|
| | A | B | C | D | |
| X | 9 | 12 | 9 | 6 | 70 |
| Y | 7 | 3 | 7 | 7 | 60 |
| Z | 6 | 5 | 9 | 11 | 90 |
| Demand | 70 | 50 | 70 | 30 | |

Q.4 In a cricket season for a one-day match a bowler bowled 50 balls. The frequency distribution of runs scored per ball is given below: **[10]**

| | | | | | | | |
|--------------|----|----|----|---|---|---|---|
| Runs / Ball | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| No. of balls | 15 | 10 | 10 | 4 | 8 | 1 | 2 |

Simulate the system for 2 overs and find average runs given in 2 overs by him.
Use the following random numbers:

88, 03, 05, 29, 28, 48, 65, 19, 55, 17, 37, 82.

Q.5 Write short notes on **ANY TWO** of the following: **[10]**

- a) Applications of Operations Research in Business and Management
- b) Degeneracy in Transportation Problem
- c) PERT and CPM Techniques

P.T.O.

SECTION – II

- Q.6** 5 men are available to do five different jobs. From past records the time (in hours) that each man takes to each job is known and is given in the following table: [10]

| Man | Jobs | | | | |
|-----|------|----|-----|----|---|
| | I | II | III | IV | V |
| A | 2 | 9 | 2 | 7 | 1 |
| B | 6 | 8 | 7 | 6 | 1 |
| C | 4 | 6 | 5 | 3 | 1 |
| D | 4 | 2 | 7 | 3 | 1 |
| E | 5 | 3 | 9 | 5 | 1 |

Find the assignment of men to jobs that will minimize the total time taken.

- Q.7** Find the optimum solution for the following transportation problem for Maximization. The figures given are profit per unit. [10]

| Sources | Destinations | | | Availability |
|----------------|----------------|----------------|----------------|--------------|
| | D ₁ | D ₂ | D ₃ | |
| S ₁ | 10 | 12 | 15 | 25 |
| S ₂ | 17 | 13 | 9 | 30 |
| S ₃ | 20 | 15 | 7 | 40 |
| Demand | 28 | 43 | 24 | 95 |

- Q.8** A project has the following time schedule: [10]

| Activity | 1 – 2 | 1 – 3 | 1 – 4 | 2 – 5 | 3 – 6 | 3 – 7 | 4 – 6 | 5 – 8 | 6 – 9 | 7 – 8 | 8 – 9 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Time (hours) | 20 | 20 | 10 | 40 | 80 | 50 | 30 | 10 | 50 | 40 | 30 |

- Construct PERT Network and compute earliest and latest time for each activity.
- Compute Critical path and its duration.

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