

MBA II Semester Regular & Supplementary Examinations August 2014

OPERATIONS RESEARCH

(For students admitted in 2010, 2011, 2012 and 2013 only)

Time: 3 hours

Max. Marks: 60

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Develop a model for dependent and independent variables for factors influencing managerial decision with a hypothetical example.
(b) Distinguish between operations research and operations management.

- 2 Solve the following problem by simplex method.

$$\text{Maximize } z = 9x_1 + 14x_2$$

$$\text{Subject to } x_1 + x_2 \leq 100$$

$$x_2 \leq 60$$

$$2x_1 + 3x_2 \leq 450$$

$$\text{and } x_1, x_2 \geq 0.$$

- 3 How do you achieve optimization in transportation models? Explain with a suitable example.
- 4 A sales manager has to assign salesmen to four territories. He has four candidates of varying experience and capacities. You are required to find the assigning task to each salesman using assignment model.

| Salesmen | Territories | | | | |
|----------|-------------|----|----|----|----|
| | A | B | C | D | E |
| 1 | 70 | 54 | 56 | 74 | 58 |
| 2 | 56 | 68 | 58 | 80 | 61 |
| 3 | 70 | 48 | 64 | 60 | 72 |
| 4 | 48 | 64 | 50 | 64 | 63 |

- 5 Solve the following 2 person zero-sum game using graph method.

Player B

$$\text{Player A } \begin{bmatrix} 16 & -6 & 4 \\ 9 & -8 & 11 \\ -4 & 4 & -5 \end{bmatrix}$$

- 6 Explain the procedure of job sequencing of 'n' jobs through 2 machines.
- 7 Trucks arrive at a safety inspection station so that the inter arrival times are exponentially distributed with a mean of 1/3 hour. The times required for inspection are also exponentially distributed with a mean of 1/5 hour. Assume that the associated queuing system is in steady state.
- 8 Draw a network diagram and find critical path for the following activities.

| Activity | Duration |
|----------|----------|
| 1 – 2 | 10 |
| 1 – 3 | 15 |
| 2 – 4 | 10 |
| 2 – 5 | 15 |
| 3 – 5 | 12 |
| 4 – 6 | 11 |
