No. of Printed Pages—3

85E (OR)

[18–HRGPKAC–M3S]

MBA 3rd Semester Exam., 2018

OPERATIONS RESEARCH

[MBA (S3) 13]

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer any *five* from the following questions (each within *50* words) : 2×5=10

(a) Define 'operations research' (OR).

(b) What is a dual problem?

(c) Define 'feasible solution'.

(d) State the concept of 'two-person games and *n*-person games'.

(e) Write the full forms of PERT and CPM.

(f) State two limitations of operations research.

2. Answer any *three* from the following questions (each within *150* words) : 4×3=12

(a) What is a model? Discuss the advantages of modelling. 1+3

(b) What is transportation problem? State different methods used in finding initial solution of transportation problem. 2+2

(c) Discuss the essential characteristics of operations research.

(d) Write a short note on 'Network scheduling'.

3. Answer any *three* from the following questions : 6×3=18

(a) Discuss three important operations research techniques which are used by decision makers in modern times in business and industry. 2+2+2

(b) Write the dual of the following primal LP problem :

$$\text{Max } Z = x_1 + 2x_2 + x_3$$

subject to

$$2x_1 + x_2 - x_3 \leq 2$$
$$-2x_1 + x_2 - 5x_3 \geq -6$$
$$4x_1 + x_2 + x_3 \leq 6$$
$$x_1, x_2, x_3 \geq 0$$

(c) Explain the meaning of linear programming. Also state the graphical method of solving an LPP involving two variables. 2+4

(d) Discuss the steps involved in Vogel's approximation method for finding the initial solution.

4. Answer any *four* from the following questions : 10×4=40

(a) Using the following cost matrix, determine the—

(i) optimal job assignment;

(ii) cost of assignment. 5+5

Mechanic \ Job	1	2	3	4	5
A	10	3	3	2	8
B	9	7	8	2	7
C	7	5	6	2	4
D	3	5	8	2	4
E	9	10	9	6	10

(b) What is a payoff matrix? Solve the game with payoff matrix

$$\begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$$

Also state the limitations of game theory. 2+4+4

(c) Construct a network for each of the projects whose activities and their precedence relationships are given as follows :

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	—	—	—	A	B	B	C	D	E	H, I	F, G

(d) Write a short note on problem formulation in solving an operations research problem. Also state how operations research helps in modern business management. 6+4

(e) Write short notes on the following : 5+5

(i) Crashing

(ii) Simplex method

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