Krishna Kanta Handiqui State Open University
MBA 4th Sem. Examination, 2016
Operation Research

Time : 3 Hrs. *Full Marks : 80*

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

   (a) What are the two methods of simulation ?

   (b) Write the name of fields where Linear Programming Problem (LPP) can be used.

   (c) Define optimum feasible solution of LPP.

   (d) How do you formulate a Problem correctly ?

   (e) What do you understand by certainty in linear programming ?

   (f) Write any two methods of obtaining an initial solution of transportation problem.

   (g) What is PERT ?

2. Answer *any three* from the following questions : 4×3=12

   (a) What are the various classification of problems in Operation Research ?

   (b) A paper mill produces two grades of paper X and Y. Because of raw material restrictions, it can not produce more than 400 tons of grade X and 300 tons of grade Y in a week. There are 160 production hours in a week. It requires 0.2 and 0.4 hours to produce a ton of products X and Y respectively with corresponding profits of Rs. 200 and Rs. 500 per ton. Formulate this as an LPP to maximize profit.

(c) Define feasible, basic, non-degenerate solutions of a transportation problem.

(d) Write four properties of 'Game'.

(e) Explain the methodology involved in resource levelling.

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

(a) Write a note on the various phases in solving an OR problem.

(b) Write the dual of the following LPP.

Min $z = 2x_2 + 5x_3$

Subject to $x_1 + x_2 \geq 2$

$2x_1 + x_2 + 6x_3 \leq 6$

$x_1 - x_2 + 3x_3 = 4$

$x_1, x_2, x_3 \geq 0.$

(c) Four persons A, B, C and D are to assigned four jobs I, II, III and IV. The cost matrix is given as under, find the proper assignment—

Man / Jobs	A	B	C	D
I	8	10	17	9
II	3	8	5	6
III	10	12	11	9
IV	6	13	9	7

(d) For what type of business can game theory be useful ? Explain.

(e) What is a critical activity and critical path ? Explain the iterative procedure for determining the critical path.

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

(a) Explain the important OR techniques.

(b) Solve the following linear programming problem by simplex method :

Maximize $z = 6x_1 - 8x_2 + x_3$

Subject to the constraints

$3x_1 + x_2 \leq 10$

$4x_1 - x_2 \leq 5$

$x_1 + x_2 - x_3 \geq -3$

$x_1 \geq 0, x_2 \geq 0, x_3 \geq 0$

(c) Solve the following transportation problem to maximize the profit.

		Destination				
Source		A	B	C	D	Supply
	1	15	5	42	33	23
	2	80	42	26	81	44
	3	90	40	66	60	33
	Demand	23	31	16	30	100

(d) Write the steps for finding a solution using the Hungarian method.

(e) Discuss the various type of games with examples.

(f) Define 'crashing' and 'crashing time'. When is crashing preferred ? Explain the procedure of crashing a project.

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