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Roll No.   Total No. of Pages : 03

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MBA (2009 to 2011) (Sem.–3rd)
APPLIED OPERATIONS RESEARCH
Subject Code : MB-301
Paper ID : [C0197]

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students has to attempt any FOUR questions.

SECTION-A

1. Answer briefly :

   (a) Differentiate between Slack and Artificial Variables.

   (b) Define Trans-shipment Problem.

   (c) Define the terms Balking, Jockying and Holiday Time in queue system.

   (d) Distinguish between Ordering Cost and Carrying Cost.

   (e) Differentiate between Individual Replacement Policy and Group Replacement Policy.

   (f) Primal-Dual Relationship.

   (g) Dominance principle in game theory.

   (h) Explain the terms Interfence float and Independent float.

   (i) Hurwicz criterion.

   (j) Bellman's principle of optimality.

SECTION-B

2. Explain the concept, scope and methodology of Operation Research as applicable to business and Industry. (10)

3.   Maxmize $Z = 6x_1 + 10x_2 + 2.$

   s.t. $2x_1 + 4x_2 + 3x_3 \leq 40;$

          $x_1 + x_2 \leq 10;$

          $2x_2 + x_3 \leq 12$ and x_1, x_2, x

4. (a) The ABC tool company has a sales forc
       from three Regional offices. The company
       lines of hand tools. Mr. Jain, sales manag
       needed to distribute product line 1; 10 sa
       line 2; 4 salesmen to product line 3; and
       4. The cost (in Rs.) per day of assigning
       offices for selling each of the product lines

Regional Office	Product	
	1	2
A	20	21
B	17	28
C	29	23

   At the present time, 10 salesmen are allo
   to office B and 7 salesmen to office C. H
   be assigned from each office to selling ea
   minimize costs ?

   (b) Five men are available to do five differe
       the time in (hrs.) that each man takes to
       given in the following matrix :

Men	Jobs		
	I	II	III
A	2	9	2
B	6	8	7
C	4	6	5
D	4	2	7
E	5	3	9

   Find the assignment of men to jobs that will m

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5. (a) Why inventory is maintained ? Give uses and abuses of maintaining inventory.

(b) Solve the 3 × 4 game given below graphically.

	B_1	B_2	B_3	B_4
A_1	4	−2	3	−1
A_2	−1	2	0	1
A_3	−2	1	−2	0

(5, 5)

6. Consider the following schedule of activities and related information for the construction of a new plant :

Activity	Expected Time		Expected Cost
	Months	Variance	Rs. 00,000's
1–2	4	1	5
2–3	2	1	3
3–6	3	1	4
2–4	6	2	9
1–5	2	1	2
5–6	5	1	12
4–6	9	5	20
5–7	7	8	7
7–8	10	16	14
6–8	1	1	4

Assuming that cost and time required for one activity are not dependent upon cost and time of any other activity and variations are expected to follow normal distribution, calculate :

(a) Critical path; (b) Expected cost of construction of plant; (c) expected time required to build plant; (d) Standard deviation of expected time.

(10)

7. Write short notes on **any two** :

(a) Decision Tree Analysis

(b) Sensitivity Analysis

(c) Replacement Models.

(5, 5)

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