

M.B.A. (I B) DEGREE II SEMESTER EXAMINATION, APRIL 2010

SMI 2208 MANAGEMENT SCIENCE

Time : 3 Hours

Maximum Marks : 50

(5 x 10 = 50)

- I. A. (a) Illustrate the application of decision theory with an example. (5)
 (b) Discuss the role of management science in management decision making. (5)

OR

- B. Players A and B play a game in which each player has three coins [25p, 50p and 100p]. Each of them selects a coin without the knowledge of the other person. If the sum of the values of the coins is an even number, A wins B's coin. If that sum is an odd number, B wins A's coin.

- (i) Develop a payoff matrix with respect Player A. (2)
 (ii) Find the optimal strategies for the players. (8)

- II. A. Consider the following LP problem :

$$\text{Maximize } Z = 3X_1 + 2X_2 - 5X_3$$

$$\text{Subject to } X_1 + X_2 \leq 2$$

$$2X_1 + X_2 + 6X_3 \leq 6$$

$$X_1 - X_2 + 3X_3 = 0$$

$$X_1, X_2 \text{ and } X_3 \geq 0$$

- (i) Solve the above linear programming problem. (5)
 (ii) If the right hand side of the problem is changed from (2, 6, 0) to (2, 10, 5), find the new optimal solution. (5)

OR

- B. Solve the following integer linear programming problem optimally using branch and bound technique :

$$\text{Maximize } Z = 6X_1 + 8X_2$$

$$\text{Subject to } 4X_1 + 5X_2 \leq 22$$

$$5X_1 + 8X_2 \leq 30$$

$$X_1, X_2 \geq 0 \text{ and integers. (10)}$$

- III. A. A college is having an undergraduate programme for which the effective semester time available is very less and the degree course requires field work. Hence, the savings in the total number of class hours handled can be utilized for such field work. Based on past experience, the college has established the number of hours required by each faculty to teach each subject. The course in its present semester has 4 subjects and the college has considered 6 existing faculty to teach these courses. The objective is to assign the best 4 teachers out of these 6 faculty to teach 4 different subjects such that the total number of class hours required is minimized. The data for this problem is summarized below. Solve and optimize the assignment problem.

Faculty	Subject			
	1	2	3	4
1	25	44	33	35
2	33	40	40	43
3	40	35	33	30
4	44	45	28	35
5	45	35	38	40
6	40	49	40	46

(10)

OR

(Turn Over)