UvaWellassa University

Faculty of Management

Degree of Bachelor of Business Management in Entrepreneurship and Management

FOURTH YEAR FIRST SEMESTER EXAMINATION –FEBRUARY \MARCH2012

EMG 462 -3Strategic Decision Management

Strategic Decision Management
4th Year 1st Semester - 2012

Part C – Essay Questions

Answer **only Three (03)** questions from Part C **including Question number (01)**

Marks allocation: 50 Marks

01.

a) A company makes three products X , Y and Z. Each product must be processed on two machines Type I and Type II. The total machine time available per month on each machine is 300 hours. The company can earn profit of Rs.40 per unit on X, Rs.30 per unit on Y and Rs.45 per unit of Z. Product X requires 1 hour of machine time from Type I machine and 3 hours of machine time from Type II machine . Product Y requires 2 hour of Machine Type I and 1 hour on machine Type II. Product Z requires 2 hour of machine time from each machine.

There are only 500 units available for a month of a special component which used only in products X and Z. product X needs 2 units and product Z need 1 unit from this special component

There is an agreement with a trade association to produce no more than 150 units of product X per month.

i. Formulate this production problem as linear programming model

(5 marks)

ii. Setup the initial simplex tableau

(5 marks)

b) Given the following linear programming problem

Maximize: $Z = 3X_1 + 1X_2$

Subject to: $6X_1 + 4X_2 \leq 48$

$3X_1 + 6X_2 \leq 42$

$X_1, X_2 \geq 0$

Graphically solve the problem. Using your results, demonstrate that "the optimal solution to a linear programming problem is feasible, but a feasible solution is not necessarily optimal"

(10 marks)

(13)

02. Suppose that an industry consists of two firms that produce a homogeneous product. Suppose that each firm decides how much to produce and assumes that its rival will not alter its level of production in response.

The market clearing price is:

$P = 155 - 5(Q1 + Q2)$ where $Q1 + Q2 < 31$

Q1 and Q2 represent the output of Firm 1 and Firm 2, respectively.

The total cost equations of the two firms are:

$TC1 = 5Q1$

$TC2 = 5Q2$

i. Write down Strategic form of this game.

(04 Marks)

ii. Find the best response functions of each firm.

(05 Marks)

iii. Calculate the Nash equilibrium of this game (Profit maximizing output levels)

(03 Marks)

iv. Calculate the profit for each firm at Nash equilibrium.

(03 Marks)

03.

a) Suppose that two players game has the following payoff matrix.

$$P = \begin{bmatrix} -1,1 & 3,-3 \\ 2,-2 & 0,0 \end{bmatrix}$$

i. What is the optimal mixed strategy for player1?

(04 Marks)

ii. What is the optimal mixed strategy for player2?

(04 Marks)

iii. If each player uses the optimal mixed strategy, what is the expected value of the game for player 01?

(04 Marks)

b) A farmer has a choice of growing wheat, barley, or rice. His success will depend on the weather, which could be dry, average, or wet. His payoff matrix is as follows.(You have given the farmers (player 01s') payoff)

		Crop Choices		
		wheat	barley	rice
Weather	dry	23	13	11
	average	18	16	20
	wet	10	20	21

If the probability that the weather will be dry is 20%, the probability that it will be average is 50%, and the probability that it will be wet is 30%, what is the farmer's best choice of crop?

(03 Marks)

04. Suppose that an industry consists of two firms that produce a homogeneous product. Assume that they both choose advertising levels simultaneously.If both aggressively promote their products with a nationwide advertising campaign, each will earn profits of Rs.4 million. If .one advertises while the other does not, the firm that advertises will earn Rs.15 million, while the one that does not advertise will earn Rs.2 million. If neither advertises, both will earn Rs.10 million.

i. What is the list of players?

(02 Marks)

ii. What are the strategy sets for each player?

(02 Marks)

iii. What is the strategy profile?

(02 Marks)

iv. Define a utility function for this game.

(02 Marks)

v. Write down the payoff matrix for this game.

(02 Marks)

vi. Is there a dominant strategy for firm 01? If so, what is it?

(02 Marks)

vii. Is there a dominant strategy for firm 02? If so, what is it?

(02 Marks)

viii. What is the Nash equilibrium of this game?

(01 Marks)