

CRAWFORD UNIVERSITY  
 COLLEGE OF BUSINESS AND SOCIAL SCIENCES  
 DEPARTMENT OF ADMINISTRATION AND MANAGEMENT  
 HARMATTAN SEMESTER EXAMINATION 2017/2018  
 BUS 411: BUSINESS DECISIONS AND ANALYSIS

TIME: 2 $\frac{1}{2}$ hrs

Instructions: Answer Four questions in all.

- (1a) Graphically, describe the stages of operation research 6marks.
- (1b) Discuss five relevance of operational research to business analysis. 5marks.
- (1c) Explain with examples replacement analysis. 4marks
- 2(a) A company wishes to introduce a new product by replacing the old one and ensures a much higher price (S<sub>1</sub>) or a moderate high price (S<sub>2</sub>) or a small and negligible high price (S<sub>3</sub>) is charged. However, the following states of nature of the sales exist; increase in sales (N<sub>1</sub>), No change in sales (N<sub>2</sub>), and, Decrease in sales (N<sub>3</sub>). The following payoff table in terms quarterly profits for the nature and strategies is given by the marketing department of the company.

Strategy	State of nature		
	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>
S <sub>1</sub>	6000	2000	500
S <sub>2</sub>	4000	3500	1000
S <sub>3</sub>	3000	2000	2000

Required: Determine the

strategy to be adopted for the above problem by using;

- i. Maximax criterion. 3mks.
  - ii. Maximin criterion. 3mks.
  - iii. Regret criterion. 3mks.
- 2b. Discuss four types of business decision environment. 6marks

- (3a) A Farmer supplied the following minimum qualities of corn to a miller. 180 tonnes of white, 149 tonnes of yellow, 96 tonnes of others. The farmer operates from 3 farms A, B and C. The units of grain delivered on each trip from A, B and C are shown in the table below.

FARM	WHITE	YELLOW	OTHERS
A	3	14	8
B	2	18	3
C	4	20	5

Given that each trip from A, B and C cost =N=500, =N=600, =N=700 respectively, minimize the cost of transportation and advise the farmer accordingly. 11marks

3b Discuss four factors to consider in replacement problem. 4marks.

4(a) The items supplied from points P, Q, R and S to destinations 1, 2, 3, 4, with the prices shown in the table below: The demand for P was 3250, Q 250, R 1750, and S 1250; Source 1 can supply 1250 items, Source 2 supplies 2000, 3 can supply 500 and 4 can supply 2750.

SOURCE	P	Q	R	S	SUPPLY
1	26	45	28	46	
2	50	27	48	30	
3	43	50	52	43	
4	65	40	49	35	
DEMAND					

If the figures in the boxes are the unit costs of moving the items from source to destination, fill the table and use the least cost method to calculate the cost of transportation 10marks

4(b) Illustrate with example the basic difference between balanced and unbalanced transportation problem. 5marks

Total 15marks

5(a) Using the table above in question 4, formulate a linear programming model 6marks

5(b) Using a typical example with a well illustrated diagram explain seasonal variation. 5marks

5(c) State any 4 assumptions of transport model. 4marks

Total 15marks

6a, What are the assumptions of linear programming 3marks

(i) Mention 5 practical areas in which you can apply linear programming for optimal solutions 3marks

6b, A brand of soap is to be produced. Using the table below, solve for optimal value, using linear programming 9marks

	Brand 1	Brand 2	Available Amount
Assembly time	3hrs	8hrs	80hrs
Inspection time	2hrs	1hr	30hrs
Storage space	3ft	3ft	40ft
Unit price	₦ 250	₦ 200	

Total 15marks