



CRAWFORD UNIVERSITY

FAITH CITY, IGBESA, OGUN STATE

HARMATTAN SEMESTER EXAMINATION, 2022/2023 SESSION

BUS 411: ANALYSIS FOR BUSINESS DECISION

TIME: 2.5 HOURS

INSTRUCTION: Answer any FOUR questions in all.

1a. Briefly define the term decision making and examine its major components in decision theory. 8marks.

1b. Explain the following terms

i. Basic feasible solution 3.5 marks

ii. Optimality solution. 3.5marks.

Total 15 marks

2. A company wishes to introduce a new product by replacing the old one and ensures a much higher price (S_1) or a moderate high price (S_2) or a small and negligible high price (S_3) is charged. However the following states of nature of the sales exists (i) Increase in sales (N_1) (ii) No change in sales (N_2) and (iii) Decrease in sales (N_3). The following payoff table in terms of quarterly profits for the natures and strategies is given by the marketing Department of the company

States of Nature

Strategies	N_1	N_2	N_3
S_1	1200000	400000	100000
S_2	400000	700000	200000
S_3	600000	400000	400000

Determine the strategy to be adopted for the above problem using

(i) Maximax Criterion) ii). Maximum Criterion. (iii). Minimax Regret

(iv). Hurwicz Criterion (iv). Laplace Criterion. 15 marks

3 The manufacturer of BP toothpaste currently controls 60% Of the market in a particular city. Data from the previous year show that 88% of BP toothpaste customers remain loyal to BP while 12% of BP customers switched to rival bands. In addition, 85% of the competitor's customers remain loyal to the competitor's while the other 15% switched to BP toothpaste. Assuming the trend continue, determine BP market share in the 5th years and in the long run. 15 marks

4a. A management is faced with the problem of choosing one of the products for manufacturing. The probability matrix after market research for the two products was as follows.

Act	States of Nature		
	Good	Fair	Poor
Product A	0.75	0.15	0.10
Product B	0.60	0.30	0.10

The profit that the management can make for different levels of market acceptability of the products are as follows

Profit (N) if market is	State of nature		
	Good	Fair	Poor
Acts			
Product A	35000	15000	5000
Product B	50000	20000	-3000

Calculate the expected value of the choice of alternatives and advise the management. 7marks

4b. With appropriate example(s), discuss four basic business decision environment in management sciences. 8 marks.

Total 15 marks

5a A manufacturing production line turns out about 100 cars a day but deviations occur owing to many reasons. The production is more accurately described by the probability distribution given below:

Production /Day	95	96	97	98	99	100	101	102	103	104	105	106
Probability	0.03	0.05	0.07	0.10	0.15	0.18	0.13	0.10	0.03	0.04	0.05	0.07

Finished cars are transported across the bay at the end of each day by ferry. If the ferry has space for 100 cars, what will be the available number of cars waiting to shipped and what will be the average number of empty spaces on the ship using the following random numbers 97, 02, 80, 66, 96, 55, 50, 29, 56, 51, 04, 86, 24, 39, 47. 10 marks

5b. Explain four benefits of simulation in management sciences. 5marks.

Total 15 marks

6. The following mortality rates have been observed for a certain type of light bulbs.

Week	1	2	3	4	5
Percentage failing	10	25	50	80	100

There are 1000 bulbs in use and it costs N 2 to replace an individual bulb which has been burnt out. If all the bulbs were replaced simultaneously it would cost 50k per bulb. It is proposed to replace all the bulbs at fixed intervals whether or not they have burnt out and to continue replacing burnt out bulbs as they fail. At what interval should all the bulbs be replaced? 15marks.