



PAN AFRICA CHRISTIAN UNIVERSITY

**BACHELOR OF COMMERCE / BACHELOR OF BUSINESS
LEADERSHIP**

END TERM EXAMINATION – ONLINE

DEPARTMENT: BUSINESS STUDIES

COURSE CODE: BCM 303

COURSE TITLE: MANAGEMENT DECISION MODELS

Time: 3 HOURS

Instructions

- Read all questions carefully before attempting.*
- Question ONE is COMPULSORY.*
- Answer ANY THREE questions out of the remaining FIVE*

QUESTION ONE (Compulsory)

- a) Highlight any TWO reasons why the decision-making process is significant for an organization. **(2 marks)**
- b) Define the following terms
 - i. Operations research **(2 marks)**
 - ii. Linear programming **(2 marks)**
- c) As the manager of your company, discuss any management decision model and how you would use it as a solution to the organization's problem(s). **(4 marks)**

QUESTION TWO

- a) Highlight the five main components of waiting in line to be served as proposed by the queuing theory. **(5 marks)**
- b) Explain the five types of queues of service in relation to queuing theory. **(5 marks)**

QUESTION THREE

- a) Outline any FIVE assumptions in Game theory **(5 marks)**
- b) Discuss any FIVE importance of Game theory **(5 marks)**

QUESTION FOUR

Company ABS is faced with the below decision alternatives based on the three states of nature.

DECISION ALTERNATIVE	STATE OF NATURE		
	s1	s2	s3
d1	4	4	-2
d2	0	3	-1
d3	1	5	-3

Required

Calculate the recommended decision when using the below decision-making strategies

- i. The Optimistic Approach **(2 marks)**
- ii. The Conservative Approach **(2 marks)**
- iii. The Minimax Regret Approach **(6 marks)**

QUESTION FIVE

In an organization, two projects are being considered for funding. The probability of project A being very successful and making KES 6,000 profit are 20%, the probability of project A being moderately successful and creating KES 3,500 profit are 50% with all other outcomes generating profit of KES 2,500. The probability of project B being very successful and fetching KES 6,500 profit are 10%, of being moderately successful and rendering KES 4,000 are 60% with all other outcomes generating profit of KES 1,000.

Required

- a) Calculate the Expected Monetary Value of:
 - i. Project A (4 marks)
 - ii. Project B (4 marks)
- b) Giving reasons, determine which project and the decision that should be taken. (2 marks)

QUESTION SIX

- a) A retail store stocks two types of shirts A and B. During a week the store can sell a maximum of 400 shirts of type A and a maximum of 300 shirts of type B. The storage capacity, however, is limited to a maximum of 600 of both types combined. Type A shirt fetches a profit of KES. 2 per unit and type B a profit of KES. 5 per unit. Formulate the linear programming constraints to determine how many of each type of shirt the store should stock per week to maximize the total profit. (5 marks)
- b) A patient consults a doctor to check up his ill health. The doctor examines him and advises him that he is having deficiency of vitamin A and vitamin D. The doctor advises him to consume vitamin A and D regularly for a period of time so that he can regain his health. He prescribes tonic X and tonic Y, which are having vitamin A, and D in certain proportion. He also advises the patient to consume at least 40 units of vitamin A and 50 units of vitamin daily. The cost of tonics X and Y and the proportion of vitamin A and D that present in X and Y are given in the table below.

<i>Vitamins</i>	<i>Tonics</i>		<i>Daily requirement in units.</i>
	<i>X</i>	<i>Y</i>	
<i>A</i>	2	4	40
<i>D</i>	3	2	50
Cost in Rs. per unit.	5	3	

Required

Formulate the linear programming constraints to minimize the cost of tonics.

(5

marks)