



PAN AFRICA CHRISTIAN UNIVERSITY

BACHELORS OF COMMERCE

END OF TERM EXAMINATION

DEPARTMENT: BUSINESS

COURSE CODE: BCM 303

COURSE TITLE: MANAGEMENT DECISION MODELS

EXAM DATE: FRIDAY

TIME: 11.00AM – 2.00PM

INSTRUCTIONS

- This examination script consists of **six (6)** questions.
- Answer question ONE and ANY other three Questions.
- Show all your workings
- Read all questions carefully before attempting.

Write your **student number** on the answer booklet provided.

QUESTION ONE

- a) Describe any two benefits of management decision models in business (4marks)
- b) Using a relevant example in each case, distinguish between the following terms:
 - i) Risk and uncertainty (2marks)
 - ii) Minimal spanning tree problem and maximal flow problem (2marks)
 - iii) Seasonal variation and cyclical variation(2marks)

QUESTION TWO

An ice cream seller is trying to decide on the amount of ice cream to order given their different sizes of under different states of nature. The cost of each ice cream is sh5, while the selling price is sh7 per unit. The demand (units) for each size of ice cream is shown in table below:

	State of nature		
Order	Cold	Warm	Hot
Small	20	300	600
Medium	70	10	450
Large	120	200	15

Required:

Determine the best size of ice cream to order based on:

- a) Max Min decision criterion (4marks)
- b) Min Max Regret decision criterion (6marks)

QUESTION THREE

- a) Explain any two applications of linear programming in business (2marks)
- b) KK Ltd. produces two types of detergents A and B. The contribution to profit for type A and type B is sh500 and sh400 respectively. The detergents have to pass through three departments during production and the labor hours required and available for each product in each department is given in the table below:

Product	Mixing	Packing
A	11	4
B	6	3
Maximum hours available	700	200

Required:

- a) Formulate a linear programming model (4marks).
- b) Determine the number of units of each type of detergent that should be produced in order to maximize profit (4marks)

QUESTION FOUR

- a) Explain any two applications of network analysis in business (2marks)
- b) The following transportation data has been provided:

Center	A - B	A - C	A - D	B - D	B - E	C - B	C - E	C - F	D - G	E - D	E - G	F - G
Distance (Kilometers)	6	2	16	5	4	7	3	8	3	4	10	1

Required:

- i) Determine the shortest path from center A to Center G (6marks)
- ii) Compute the shortest distance in Kilometers (2marks)

QUESTION FIVE

The following forecast was made during the 6 months in year 2019:

Month	Jan	Feb	Mar	April	May	June
Adverts (turns)	21	180	50	195	96	44
Revenue (sh)	8,350	22,775	13,455	21,100	15,000	12,500

Required:

- a) Formulate the linear regression model (8marks)
- b) Forecast the amount of revenue that will result from 171 adverts (2marks)

QUESTION SIX

- a) Explain the term sensitivity analysis (2marks)
- b) Using a relevant example, describe any two benefits sensitivity analysis (4marks)
- c) Discuss two applications of linear regression (4marks)