AFRICA UNIVERSITY
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COLLEGE OF BUSINESS, PEACE, LEADERSHIP, AND GOVERNANCE

MMS 204: QUANTITATIVE ANALYSIS 2

END OF SECOND SEMESTER FINAL EXAMINATION

APRIL/MAY 2023

LECTURER: MUGWAGWA T.M

DURATION: 3 HOURS

INSTRUCTIONS

ANSWER ALL QUESTIONS IN SECTION A

CHOOSE ONLY ONE QUESTION FROM SECTION B

Mark allocation is as indicated in brackets.

Credit will be given for answers that are well constructed and well presented. All workings must be shown.

Use of a non-programmable calculator is permissible. Statistical tables, formula sheet, and graph paper are provided.

Answer all Questions in Answer Books provided.

SECTION A

Answer all questions from this section

QUESTION 1

A decision maker is faced with the situation of having to decide whether to invest in bonds, stocks or mutual funds. His decision alternatives will be influenced by whether the economy growing or the economy being stable or the economy declining.

The information is illustrated in the payoff table below.

	ECONOMY		
ALTERNATIVES	GROWING	STABLE	DECLINING
BONDS	40	45	5
STOCKS	70	30	-13
MUTUAL FUNDS	53	45	-5

(a)From the given table list down the

i. Decision alternatives [2]

ii. States of nature or the possible outcomes [2]

(b)What is the best decision to make using:

i. The maximax approach [5]

ii. The maximin approach [5]

Using the same payoff table, but now given the probabilities for each economic condition as follows:

	ECONOMY		
ALTERNATIVES	GROWING	STABLE	DECLINING
BONDS	40	45	5
STOCKS	70	30	-13
MUTUAL FUNDS	53	45	-5

Probability	0.2	0.5	0.3

(c)Calculate the Expected Monetary Value (EMV) for each decision alternative [5]

i. Based on your calculations for the EMV, what decision should be taken by the decision maker [1]

QUESTION 2

(a) The major components in a basket of goods are believed to be mealie meal and bread. The quantities per week and prices of commodities in 1999 and 2003 are recorded below.

	1999		**2003**	
	PRICE	**QUANTITY**	**PRICE**	**QUANTITY**
Mealie meal	500	8	5000	10
Bread	76	7	1500	5

(i) Obtain the simple price indices of each of these products with 1999 as the base year. **[4]**

(ii) Calculate the Laspeyer's Price Index and comment on your results. **[4]**

(b) The following are 1998 and 1999 imports of Joshua Company of three products.

The prices are in dollars (Z$) per unit.

	Price(Z$)		**Number of Units**	
Product	**1998**	**1999**	**1998**	**1999**
A	5 000	12 000	2 500	2 800
B	6 500	14 500	5 000	4 950
C	10 000	16 000	3 500	4 300

(i) The following statement is made concerning this data. "From 1998 to 1999 the price of product A increased by 240%". Is this statement true? Justify your answer. **[3]**

(iii) Using 1998 as the base year, calculate Paasche's price index and interpret it.

[4]

QUESTION 3

a) The 35th term of an A. P. is 69. Find the sum of its 69 terms. **[5]**

b) The first term of an A. P. is 10, the last term is 50. If the sum of all the terms is 480, find the common difference and the number of terms. **[5]**

c) Find the sum of the G. P.: 1, 3, 9, 27, ... up to the 10th term. **[5]**

QUESTION 4

(a) The following data are the temperature of effluent at discharge from a sewage treatment facility on 24 consecutive days.

43	47	51	48	52	50	46	49	45	52	46	51
44	49	46	51	49	45	44	50	48	50	49	50

Plot the time series on graph paper. **[4]**

(b) Comment on the trend **[1]**

(c) Find the 3-point moving average of the data **[6]**

(d) Plot the 3-point moving average series on the same graph paper. Comment on the smoothing effected by the 3 – point moving average. **[3]**

(e) Calculate the forecast for the 25-day using a weighted 4 point moving average. **[1]**

SECTION B

ANSWER ONLY ONE OF THESE TWO QUESTIONS FROM THIS SECTION

QUESTION 5

The following table gives data for a simple project.

Activity	Preceding Activity	Duration(days)
A	-	3
B	-	3
C	-	7
D	A	1
E	D,J	2
F	B	2
G	C	1
H	E,F,G	1
J	B	1

a) Draw a network diagram for the project showing the earliest and latest times for each activity. Calculate the project completion time. **[12]**

b) State the critical path. **[3]**

QUESTION 6

A second-hand car dealer has 10 cars for sale. The data collected from the cars

Age(years)		2	2.5	3	4	4.5	5	3	6	6.5	4.5
Mileage(km)		22	34	33	37	40	49	30	58	58	45

i. Calculate Pearson's correlation coefficient for the data and interpret it**.** **[4]**

ii. On graph paper draw the scatter diagram of age against mileage for these cars **[4]**

iii. Find the equation of regression line of mileage on age in the form
mileage= a + b(age) **[3]**

iv. Give a practical interpretation of a and b. **[3]**

v. Plot your regression line on your scatter plot**.** **[2]**

vi. Use your regression line to estimate the mileage of a 5-year-old car. **[2]**

vii. Comment about the reliability of your estimate. **[2]**

END OF EXAMINATION