The Management University of Africa

Sponsored by the Kenya Institute of Management

POSTGRADUATE UNIVERSITY EXAMINATIONS

SCHOOL OF MANAGEMENT AND LEADERSHIP

DEGREE OF DOCTOR OF PHILOSOPHY IN MANAGEMENT AND LEADERSHIP

DML 900: ADVANCED STATISTICS

DATE: 6TH APRIL 2023

DURATION: 3 HOURS

MAXIMUM MARKS: 50

INSTRUCTIONS:

1. Write your registration number on the answer booklet.
2. **DO NOT** write on this question paper.
3. This paper contains **FOUR (4)** questions.
4. Question **ONE** is compulsory.
5. Answer any other **TWO** questions.
6. Question **ONE** carries **30 MARKS** and the rest carry **10 MARKS** each.
7. **Write all your answers in the Examination answer booklet provided.**

QUESTION ONE

a) State and explain the FOUR components of a Time Series, giving , in each case, an example of a Time Series that is composed of one component only. **(8 marks)**

b) State the three assumptions of linear regression model. **(3 marks)**

c) Explain the application of the linear regression model in forecasting a Time Series. **(4 marks)**

d) Obtain the Trend of the monthly prices of some asset given by the following data; 105, 130, 115, 150, 170 140 **(6 marks)**

e) Using the results in Part b(iii) obtain the forecast for the seventh month **(3 marks)**

f) The mean annual salary paid to all employees in a company is $36,000. The mean annual salaries paid to male and female employees of the company are $34,000 and $40,000 respectively. Determine the percentages of males and females employed by the company. **(6 marks)**

QUESTION TWO

a) Distinguish between Discrete and Continuous random variables. Give two examples of the common distribution in each case. **(4 marks)**

b) The election returns showed that a certain candidate received 46% of the votes. Determine the probability that a poll of;

   i. 200 and **(3 marks)**

   ii. 1000 people selected at random from the voting population would have shown a majority of votes in favor of the candidate. **(3 marks)**

QUESTION THREE

Compute the Seasonal Index for the following data. **(10 marks)**

Year	I	II	III	IV
2001	75	60	54	59
2002	86	65	63	80
2003	90	72	66	85
2004	100	78	72	93

QUESTION FOUR

The hourly wages (in Kenya shillings) for a sample of company employees are:

2300	4300	2000	3200	1200
3400	4000	3000	2700	3200

i. Compute the Sample variance, S^2 **(3 marks)**
ii. Compute the population variance, σ^2. **(3 marks)**
iii. Determine the probability that a sample from this population will have a variance of between 1500 and 2000. **(4 marks)**