CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

CHUKA/CHOGORIA

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF EDUCATION (ARTS)

BUST 212: QUANTITATIVE METHODS IN BUSINESS

STREAMS: BED (ARTS) Y2S1 **TIME: 2 HOURS**

DAY/DATE: FRIDAY 17/12/2024 **11.30 A.M – 1.30 P.M**

INSTRUCTIONS:

Answer Question ONE and Other TWO Questions
Do not write on the question paper

QUESTION ONE (30 MARKS)

a) Discuss the various areas of application of Quantitative methods in management of commercial enterprises
(10 marks)

b) ABC Ltd. has introduced a new product branded "Nilan". The Production Manager wishes to establish the relationship between the total cost of production and the number of units produced. The Manager also believes that the relationship between the total cost of producing "Nilan" and the number of units produced is linear in nature. The following data was gathered on the production for the last 7 months:

Month	**Units produced "000"**	**Total cost of production "000"**
December 2023	67	690
January 2024	63	648
February 2024	82	699
March 2024	64	720
April 2024	90	856
May 2024	60	672
June 2024	51	630
July 2024	55	525

Required:

i) Formulate a regression function using the ordinary least squares method. (8 marks)

ii) Forecast the cost incurred in August 2024 if 61,000 units were produced (3 marks)

iii) Compute the Pearson's correlation coefficient between the number of units produced and the cost of production, and comment on the nature of the relationship (6 marks)

iv) Determine the coefficient of determination (r^2) and comment on the fitness of the regression model obtained above in (i) above (3 marks)

QUESTION TWO (20 MARKS)

a) An observed time series data can be decomposed into four components. Discuss the components clearly providing an example in each case (8 marks)

b) The amount of money spent on purchases by the first 172 customers at a large department store is summarized in the following frequency distribution table:

Amount spend in sh. "000"	**Number of customers**
230-260	12
260-290	18
290-320	22
320-350	52
350-380	35
380-410	15
410-440	12
440-470	6

Required: Compute the following statistical measures;

i) The mean amount spent by the customers (3 marks)
ii) The median amount spent by the customers (3 marks)
iii) The standard deviation of the amount spent by the customers (4 marks)
iv) The coefficient of variation of the amount spent by the customers (2 marks)

QUESTION THREE (20 MARKS)

a) Describe the characteristics of a normal probability distribution (5 marks)

b) Discuss the advantages of sample survey over census method in data collection and analyses (8 marks)

c) A group of eight students were tested in "Quantitative analysis (QA)" and "Auditing" examinations. The % marks scored were as follows:

Student	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Quantitative Analysis	76	43	49	84	69	69	53	36
Auditing	82	57	75	86	68	92	43	53

Required: Compute the Spearman's rank correlation coefficient and interpret the results obtained (7 marks)

QUESTION FOUR (20 MARKS)

a) Quantitative techniques aid in formulation of viable decisions in a business but suffers some limitations on implementation. Discuss (10 marks)

c) Kazurini Farm practice large scale maize farming whereby the output of an acre of land is assumed to be normally distributed with an average of 52 bags of maize and a standard deviation of 3.2 bags.

Required: Determine the probability that a randomly harvested acre of land would have an output that is:

i) Greater than 60 bags (3 marks)
ii) Less than 45 bags (3 marks)
iii) Lies between 50 and 60 bags (4 marks)
