OFFICE OF THE DEPUTY VICE CHANCELLOR

ACADEMICS, RESEARCH AND STUDENT AFFAIRS

UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

FIRST-YEAR SEMESTER ONE REGULAR MAIN EXAMINATION

FOR THE DEGREE OF BACHELOR OF EDUCATION

COURSE CODE: PSY110

COURSE TITLE: QUANTITATIVE AND QUALITATIVE TECHNIQUES IN EDUCATION

DATE: 6TH DECEMBER 2023 **TIME: 2:00AM-4:00PM**

INSTRUCTION TO CANDIDATES

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PSY 110: REGULAR MAIN EXAM

STREAM: BED **Time: 3 Hours**

INSTRUCTIONS TO CANDIDATES

*i). Answer Question **ONE** and any other **TWO** questions.*
ii) Do not write on the question paper.

Question One

a) Define the **THREE** most common measures of central tendency. (3 Marks)
b) Discuss the locations of the mean, mode and median in the normal distribution and in skewed distributions. (3 Marks)
c) A sample of the results of twenty one students in a continuous assessment test is given as follows:-

84, 17, 38, 45, 47, 53, 76, 54, 54, 75, 22, 66, 65, 55, 54, 51, 44, 39, 19, 54, 72

i) Calculate the mean, median and mode for this sample. (3 Marks)
ii) Comment on the symmetry of the observed data using your answer in (i) above. (1 Mark)

d) i) Study the data given below and identify if there is an outlier in the data. (7 Marks)

16, 18, 28, 13, 50, 31, 25, 22, 18, 23, 29, 31, 38

ii) Present the sketch of the given data on a box plot. (3 Marks)

e) The table below represents the sales of mobile phones made in an electronics shop for seven weeks:-

Week	Sales
1	39
2	44
3	40
4	45
5	38
6	43
7	43

i) Use a three week moving average to calculate the moving average forecast for week eight. (1 Mark)

ii) Calculate the mean absolute deviation. (3 Marks)

f) Evaluate: $4log_3 81 + 5log_4 256 + 7log_5 625$. (3 Marks)

g) Find the unknown in the following equation:-

$$\begin{pmatrix} 2 & x^2+4 \\ 2 & 3 \end{pmatrix} = \begin{pmatrix} 2 & -4x \\ 2 & 3 \end{pmatrix}$$

(3 Marks)

Question Two

a) The following data are the heights correct to the nearest centimeter for a group of children 144, 132, 138, 129, 135, 137, 143, 152, 126, 137, 161, 133, 129, 132, 133, 146, 141, 154, 147, 136

(i) Explain the distinction between continuous and discrete data and illustrate your answer by referring to the data above. (3 Marks)

ii) Draw a stem and leaf diagram of the data above. (7 Marks)

iii) Find the mean and the interquartile range of the data. (5 Marks)

b) Find the value of x in

$$(log_{27}x)^2 - log_{27}\sqrt[3]{x^2} = 3^{-1}$$ (5 Marks)

Question Three

a) Prove that $log_8 27 = log_2 3$ (5 Marks)

b) Solve $\log(7x + 2) - \log(x - 1) = 1$ (4 Marks)

c) Highlight **FIVE** importance of Time Series. (5 Marks)

d) Discuss the **THREE** types of educational achievement tests. (6 Marks)

Question Four

a) Discuss the steps of test construction (8 Marks)

b) A wholesaler keeps a weekly record of the sales of bags of sugar (S), bales of maize flour (M) and bags of rice (R) as shown on the table below:-

	S	M	R
Week 1	19	25	10
Week 2	15	35	12
Week 3	10	20	8
Week 4	9	15	7

A bag of sugar costs sh.2200, a bale of maize flour costs sh.600 and a bag of rice costs sh.1500.

Use a 4x3 matrix and a 3x1 matrix to determine the value of sales in each week. (5 Marks)

c) The data below shows iron production in specified countries in million tonnes:-

Country	Million tonnes
India	8
Japan	40
Russia	72
Germany	28
USA	80

i) Represent this information on a bar graph. (5 Marks)

ii) Explain why the bar graph is appropriate. (2 Marks)

Question Five

The table below relates to WXY Limited:-

Class interval	Frequency
35-39	3
40-44	2
45-49	5
50-54	10
55-59	12
60-64	11
65-69	5
70-74	2

You are required to:-

(a) Calculate the mean. (3 Marks)

(b) Calculate the median and mode. (5 Marks)

(c) Calculate the variance and standard deviation. (6 Marks)

(d) Construct a histogram. (6 Marks)

END

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