TECHNICAL UNIVERSITY OF MOMBASA1

Faculty of Applied and Health Sciences

Department of Environment & Health Sciences

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN MEDICAL LABORATORY ENGINEERING

DIPLOMA IN MEDICAL ENGINEERING

AMA 2202 : BIOSTATISTICS

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2019

TIME: 2 HOURS

DATE: Pick Date **Dec 2019**

Instruction to Candidates:

You should have the following for this examination

- *Answer booklet*
- *Non-Programmable scientific calculator*

This paper consists of **FIVE** questions. Attempt question **ONE** and any other **TWO** questions.

Maximum marks for each part of a question are as shown.

Do not write on the question paper.

QUESTIONS ONE

a) The questions data below represent scores of the glucose level of a cohort of patients in one day in mg/dL.

12.9, 14.5, 15.6, 13.0, 14.0 and 16.8

You are required to calculate the

      I.   Mean and   [2mks]
      II.   standard deviation   [4mks]

b) In this study of 60 year old women with glaucoma, n = 200, mean, μ. =140 mmHg, and SD = 25mm Hg. Calculate the 95% confidence interval   [4mks]

c) A life insurance salesman sells on the average 3 life insurance policies per week. Use Poisson's law to calculate the probability that in a given week he will sell 2 or more policies but less than   [5mks]

d) The probability of a baby girl born is 0.6, apply a binomial distribution to calculate

      I.   The mean and variance [5mks]
      II.   the a probability distribution of four births   [5mks]

e) A company wants to improve sales. Past sales data indicate that the average sale was $100 per transaction. After training the sales force, recent sales data (taken from a sample of 25 salesmen) indicates an average sale of $110, with a standard deviation of $15. Did the training work? Test the hypothesis at a 5% alpha level.[5mks]

QUESTION TWO

The data below relates two variable x and y

    a) Calculate the correlation coefficient   [6mks]
    b) Calculate the regression of y on x   [6mks]
    c) Use the regression equation to estimate y at x=5   [3mks]

X	2	6	8	7	9
Y	5	9	12	11	14

QUESTION THREE
    a) Calculate the mean and standard deviation [6mks]
    b) Calculate the median of the following data [3mks]

scores	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	2	4	6	6	10	5

c) A fair coin is tossed 9 times what's the probability of getting more than two head [6mks]

QUESTION FOUR

a) A random variable x is normally distributed with a mean of 30 and standard deviation of 6. Calculate the probability of x lying
    i.   More than 40   [5mks]
    ii. Less than 38   [5mks]
b) A normally random variable with mean of 56 kg standard deviation 8. If 20% of the items were declared 'unusually underweight' what was the cut off weight required weight to be declared underweight?   [5mks]

QUESTION FIVE

a) Vehicles pass through a junction on a busy road at an average rate of 3 per hour. Find the probability that

    i.   more than 2 passes in a given hour   [5mks]
    ii. Two or 3 passes pass in in an hour?   [5mks]

b) Hospital records show that of patients suffering from a certain disease, 15% of them actually die of it. What is the probability that of 10 randomly selected patients, 4 will die?   [5mks]