MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF PURE, APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MATHEMATICS AND ACTUARIAL SCIENCE

UNIVERSITY ORDINARY EXAMINATION

2023/2024 ACADEMIC YEAR

THIRD YEAR **SECOND** SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN HOSPITALITY AND TOURISM MANAGEMENT

AMS 334: STATISTICAL METHODS IN HOSPITALITY AND TOURISM

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer question one and any other two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a) State the data type (discrete or continuous) of each of the following;

i. Number of share sold each day in the stock market (1mark)

ii. Temperature recorded every half hour at weather station (1mark)

iii. Lifetimes of television tubes produced by a company (1mark)

iv. Yearly income of college professors (1mark)

b) The data below shows the performance of 30 students in a statistics examination

72 61 58 66 65 71 72 41 70 83
40 52 71 82 46 81 45 57 73 64
41 62 81 47 56 63 72 40 43 52

Using the classes 40 – 49, 50 – 59, 60 – 69, 70 – 79 and 80 – 89, construct

i) A frequency distribution table (3marks)

ii) A cumulative frequency curve (3marks)

c) The summary statistics given below are from an analysis of data from a study conducted to establish whether the variable X and Y are related

$$\sum X = 185, \sum Y = 161, \sum X^2 = 3073, \sum XY = 2565, n = 10, \bar{y} = 13.42, \bar{x} = 15.42$$

if variable X and Y are related, fit a simple linear regression equation of Y and X i.e. $Y = a + bX$ (4marks)

d) Given the data below

2, 3, 7, 8, 10

Calculate the:

i) First moment

ii) Second moment

iii) Third moment (3marks)

e) The data below shows the scores obtained by 10 BSC Tourism students in a statistics exam
18, 57, 16, 73, 9, 27, 31, 43, 52, 27

i) Calculate the 7^{th} decile of the students' marks (2marks)

ii) Using an assumed mean of 43 , calculate the standard deviation of the students marks (2marks)

f) Let A and B be any two events in the sample space such that

P(A) = 0.53 and P(AUB) = 0.82

Find P(B) if events A and B are

i) Mutually exclusive events (2marks)

ii) Independent events (2marks)

g) The data shows the distribution of students' weight

weight	30-39	40-49	50-59	60 -69	70-79	80-89
freg	33	7	12	21	11	4

Compute the Bowley's coefficient of Skewness and interpret your results (4marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a) The table below shows the results obtained from a study conducted to determine whether variables X and Y are related.

Variable X 78 86 72 82 80 86 84 89 68 71

Variable Y 140 160 134 144 180 176 174 178 128 132

i. Determine the Pearson's product moment correlation. (5marks)

ii. Determine the spear man's rank correlation coefficient. (5marks)

b) The number of stories in two selected samples of tall building in Kisumu and Nairobi is as shown below.

Kisumu

55	70	44	36	53	40	31	38	34
52	32	32	50	63	28	34	32	47
30	26	29	40	32	44	52	60	32

Nairobi

61	40	38	32	30	58	40	44	25	30	56	38
36	54	40	36	30	53	39	36	34	33	39	32

Construct a back to back stem and leaft plot and compare the distributions. (10marks)

QUESTION THREE (20 MARKS)

a) The data below shows the weight of play group pupils admitted to join Makini School in the year 2024

weight	5 - 9	10 - 14	15 - 19	20 - 24
freq	12	25	11	9

Calculate the coefficient of Kurtosis and interpret your results. (5marks)

b) The below shows the average cost per kilometre for passage vehicles on a highway per county.

County	Nairobi	Kisumu	Kisii	Nyeri	Kirinyaga
Average cost	247	197	185	195	200

Construct and analyse a poveto chart. (5marks)

c) The below shows the results of an experiment conducted to determine the time it takes for an individual to contact the virus if exposed.

Days (x)	0	1	2	3	4	5
No. of individuals	7	12	15	17	14	10

Determine:

i. The probability that an individual will take at most four days to contract the virus. (2marks)

ii. The probability that an individual will take at least 2 days to contract the virus. (2marks)

d) Let event X and W be events in the sample space such that

P(X) = 0.82 P(W) = 0.47

P(XnW) = 0.37

Determine:

i. P (XuW) = (3marks)

ii. $P(X'n\ W')$ (3marks)

QUESTION FOUR (20 MARKS)

a) The table below shows the distribution of students' weight in a first year statistics class

weight	45 -49	50 -54	55 - 59	60 - 64	65 - 69	70 - 74	75 -79
Freq.	7	14	18	11	5	9	4

Calculate

i. The mean weight of the students (use an assumed mean of 62). (3marks)

ii. The standard deviation of the students' masses using an assumed mean of 62. (5marks)

b) A study was conducted on a group of students to determine whether there is a relationship between their weights and their corresponding blood pressure

weight	52	62	71	49	67	81	90	101
Blood pressure	102	134	163	97	142	173	194	142

If the study showed that the weight and blood pressure of the students are related

Fit a simple linear regression of

Y on X $Y = a + bX$ (10marks)

What is the weight of the students whose blood pressure is 167? (2marks)