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(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2020/2021 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER

MAIN EXAMINATION

FOR

THE DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY

COURSE CODE: STA 114

COURSE TITLE: STATISTICS AND PROBABILITY

DATE: 20/7/2021

TIME: 9 AM - 11 AM

INSTRUCTIONS TO CANDIDATES

Answer Question One and Any other Two Questions

TIME: 2 Hours

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QUESTION ONE: COMPULSORY (30 MARKS)

a. Define the following research terms:

- i. Random sampling
- ii. Non-probability sampling
- iii. Stratified sampling
- iv. Descriptive statistics

(8 marks)

b. The following is a frequency distribution of main exams performance for freshers at Kibabii University.

Marks	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of students	3	16	32	53	15	10	1

Compute:

- i. Median
- ii. Quartile deviation
- iii. Harmonic mean
- iv. Geometric mean

(10 marks)

c. Given that performance of Kibabii University Bachelor of Science in Information Technology second year students is positively skewed, comment with reason on the performance

(2 marks)

d. The following shows how fertilizer used affect the maize yield for equal size plots in tonnes.

X- Fertilizer	1	3	4	6	8	9	11	14
Y- fertilizer yield	1	2	4	4	5	7	8	9

i. Calculate the product moment correlation coefficient for the above data. Comment on the nature of the relationship that exist.

(6 marks)

ii. Construct a straight line which approximate the data above and find its equation

(4 marks)

QUESTION TWO (20 MARKS)

a. Using the following frequency distribution table below:

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of Students	2	10	16	24	33	16	12	10	6	1

- i. Arithmetic mean
 - ii. Mode and median
 - iii. Variance
 - iv. Karl-Pearson coefficient of skewness **(12 marks)**
- b. Describe two limitations of mode as a measure of central tendency **(2 marks)**.
- c. The heights of individual in a dance group are as given below:
62, 21, 26, 32, 56, 36, 37, 39, 53, 40, 54, 42, 44, 61, 68, 28, 33, 56, 57, 37, 52, 39, 40, 54, 43, 43, 63, 30, 34, 68, 35, 38, 50, 38, 52, 41, 51, 44. 41, 42, 43, 44, 45, 46, 45, 47, 48, 49, 45, 46, 48.

Construct:

- i. A stem and leaf diagram
- ii. What would you say about the symmetry of the data **(6 marks)**

QUESTION THREE (20 MARKS)

The class performance in exams in a given term was recorded and the marks tabulated as below:

68	84	75	82	68	90	62	88	76	93
73	79	88	73	60	93	71	59	85	75
61	65	75	87	74	62	95	78	63	72
66	78	82	75	94	77	69	74	68	60
79	62	67	97	78	85	76	65	53	74

- i. Construct a frequency distribution table of class size 5, i.e. 50-54, 55-59, ..., e.t.c. **(2 marks)**
- ii. Compute the arithmetic mean, variance using assumed mean method, third and fourth moments about the mean for this distribution. **(14 marks)**
- iii. Compute the skewness and kurtosis, hence comment on the skewness and peakedness of this data. **(4 marks)**

QUESTION FOUR (20 MARKS)

- a. Differentiate between quantitative and qualitative research approaches to research. **(10 marks)**
- b. The following is an incomplete distribution

Variable	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	10	20	?	40	?	25	15

Suppose the median for the distribution is 35 and the total frequency is 170:

- i. Find the missing frequencies
- ii. Calculate the arithmetic mean and variance of the complete data set **(8 marks)**
- c. Distinguish between research proposal and a thesis **(2 marks)**

QUESTION FIVE (20 MARKS)

- a. Discuss five ethical issues that should be observed when collecting data for research. **(10 marks)**
- b. The table below shows the frequency distribution of masses of 100 male workers in Ematibira construction site.

Mass in Kg.	Number of Workers
60-62	5
63-65	18
66-68	42
69-71	27
72-74	8

- i. Compute the arithmetic mean for the above distribution using the model midpoint as the assumed mean **(4 marks)**
- ii. Calculate the standard deviation of the distribution and comment on your answer **(6 marks)**