

KIBABII UNIVERSITY



UNIVERSITY EXAMINATIONS 2021/2022 ACADEMIC YEAR FIRST YEAR FIRST SEMESTER

MAIN EXAMINATION

FOR THE DEGREE OF MASTER OF BUSINESS
ADMINISTRATION WITH IT

COURSE CODE: MBT 830

COURSE TITLE: BUSINESS RESEARCH STATISTICS

DATE: 03/06/2022

TIME: 9.00AM – 12.00AM

INSTRUCTIONS TO CANDIDATES

- ANSWER QUESTION **ONE** (COMPULSORY) AND ANY OTHER **THREE** QUESTIONS
- QUESTION **ONE** ATTRACTS **40 MARKS**
- ALL OTHER QUESTIONS ATTRACT EQUAL MARKS **20 MARKS**
- TIME ALLOWED IS **THREE HOURS**

QUESTION ONE (40 MARKS)

- a) Outline key steps in hypothesis testing (4mks)
- b) The data below shows ages (X) and blood pressure (Y) of 8 patients.

X:	52	63	45	36	72	65	47	25
Y:	62	53	51	25	79	43	60	33

Required, obtain the

- i) Correlation coefficient using the product method (4mks)
- ii) Regression equation of Y against X. Find the expected blood pressure of a patient aged 49 years (5mks)
- c) Use the data below to construct a frequency distribution (2mks)

57	67	72	57	83	76	74	56	68	67
74	76	79	72	61	72	73	76	67	49
71	53	67	65	98	83	69	61	72	68
65	75	68	75	66	77	61	64	74	51

Using the frequency distribution obtained above, calculate;

- i) Mean (2mks)
- ii) Median (3mks)
- iii) Standard deviation (2mks)
- iv) Degree of skewness (2mks)
- d) Suppose that 100 tyres made by a certain manufacturer lasted on average 21,809 km with a standard deviation of 1295 km. Test the null hypothesis that $\mu = 22,000$ km against the alternative hypothesis $\mu < 22,000$ km at 0.05 level of significance. (6mks)
- e) Statistics is made up of two categories of statistical methods, namely descriptive and Inferential. Differentiate them and give two examples in each category (4mks)
- f) The use of questionnaires in data collection has been so common in the recent past particularly in carrying out the national population census. Discuss. (6mks)

QUESTION TWO (20 MARKS)

- a) The table below shows monthly sales of 10 – outlets of khetia drapers and their associated advertising costs

Outlets	Bgm	Ktl	Mumias	Eld	Kk	Ksm	Wby	Malava	Kdy	Mbale
Adv Cost (x)	6	8	12	12	2	8	16	15	14	20
Monthly sales (y)	220	230	240	340	420	460	520	600	720	800

Required

- i) Compute the moment correlation coefficient (5mks)
- ii) Test whether the correlation between sales and advertising costs is significant at 5% level of significance (5mks)
- b) Job performance of 10 employees at Kibabii University was ranked by two supervisors in relation to their work as follows

	Employees									
Supervisors	A	B	C	D	E	F	G	H	I	J
1	5	6	3	9	4	8	1	7	10	2
2	3	4	1	8	5	10	6	7	9	2

Required

- i) Compute the Spearman's rank correlation (5mks)
- ii) Is it significantly less than zero at 0.025 level of significance (5mks)

QUESTION THREE (20 MARKS).

- a) The fish net manufacturing company produces nets that have the breaking strength that is normally distributed with a mean of 5 kg per square meter and a standard deviation of 1.5 kg per square meter.
What is the probability that the nets produced have a breaking strength?
- i) Between 5 kgs and 5.5 kgs (4mks)
- ii) At least 3.6 kgs per square meter (3mks)
- iii) Below what value of strength per meter will 95% of the nets fall (4mks)
- b) The binomial probability function can be applicable to any binomial experiment if we are satisfied that the situation demonstrates the properties of a binomial experiment. Give four properties that are exhibited by a binomial experiment (2mks)
- c) The University found out that 20% of the students withdraw without completing the introductory Statistics course. Assume that 15 students registered for the course, calculate the probability that
- i) Two or less withdraw (2mks)
- ii) At least three will withdraw (2mks)
- d) On average 0, 85 customers enters a service point in a minute. Find the probability that at least three customers will enter the service point in a given minute (3mks)

QUESTION FOUR (20 MARKS)

(a) Define the following terms as used in in sampling distribution and hypothesis testing

- (i) P – value (1mk)
- (ii) Estimation (1mk)
- (iii) Hypothesis (1mk)
- (iv) Null hypothesis (1mk)
- (v) Type II error (1mk)

b) Dairies would like to know whether sales of milk are distributed uniformly over a year so that they can plan for milk production and storage. A uniform distribution means that the frequencies are the same in all categories. In this situation, the producers are attempting to determine whether the amounts of milk sold are the same for each month of the year. They ascertain the number of liters of milk sold by sampling one large supermarket each month during a year. Obtaining the following data. Test whether the data fit a uniform distribution (use 1% level of significance)

(15mks)

Month	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Liters	1610	1585	1649	1590	1540	1397	1410	1350	1495	1564	1602	1655

QUESTION FIVE (20 MARKS)

- (a) Define the term “Inferential Statistics” (1mk)
- (b) Differentiate between the following terms
 - (i) Correlation and Regression analysis (2mks)
 - (ii) Independent and dependent variables (2mks)
 - (iii) Nominal and ordinal levels of measurements (2mks)
- (c) What is a sampling frame? Discuss the advantages and disadvantages of sampling (5mks)
- (d) Describe four factors that you need to consider when designing a questionnaire (2mks)
- (e) Briefly discuss any three applications and limitations of statistical data or methods in Management (6mks)