



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF HEALTH SCIENCES

**UNIVERSITY EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE
(PUBLIC HEALTH AND COMMUNITY HEALTH & DEVELOPMENT)**

3rd YEAR 1ST SEMESTER 2017/2018 ACADEMIC YEAR

REGULAR (MAIN)

COURSE CODE: SBI 3326

COURSE TITLE: BIostatISTICS I

EXAM VENUE:

STREAM:

DATE:

EXAM SESSION:

TIME: 2.00 HOURS

Instructions:

- 1. Answer question 1 (Compulsory) and ANY other 2 questions**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

QUESTION ONE (Compulsory):

a) Explain the following terms as used in biostatistics

- i) Range
- ii) Skewness
- iii) Leptokurtic distribution
- iv) Conditional probability
- v) Discrete random variables

(10 mks)

b) Explain properties of a normal distribution

(5 mks)

c) Given the frequency distribution of the data below for blood lead level of 30 individuals:

Blood lead Level(g/dl)	Frequency	Blood lead Level(g/dl)	Frequency	Blood lead Level(g/dl)	Frequency
17	1	54	1	72	1
26	2	56	1	73	1
35	1	57	2	74	1
38	1	58	3	76	2
39	1	61	1	78	3
44	1	63	1	79	1
45	1	64	1	84	1
46	1	67	1	86	1
49	1	68	1	103	1
50	1	69	1	104	1

From the above data

- i) Construct a grouped data of class interval of 10 units
- ii) Calculate the arithmetic mean
- d) i) Define probability
- iii) State two properties of probability

(5mks)

(5mks)

(5mks)

QUESTION TWO:

A) i) What is meant by a line graph?

(1mk)

ii) What advantage does it have over other methods of data presentation? (2mks)

B) Use line graphs to present the short stay hospital occupancy rates shown in the dataset below:

Hospital Ownership				
Year	National	County	Mission	Private
1960	71.6	82.5	76.6	65.4
1970	73.2	77.5	80.1	72.2
1975	69.7	77.6	77.4	65.9
1980	70.7	77.8	78.2	65.2
1985	62.8	74.3	67.2	52.1
1989	64.8	71.0	68.8	51.7

(7mks)

C) i) What is meant by mutually exclusive event?

ii) Suppose the failure rate (failing to detect smoke when smoke is present) for a brand of smoke detector is 1 in 20. For safety, two of these detectors are installed in the laboratory.

- What is the probability that smoke is not detected in the lab when smoke is present in the lab?
- What is the probability that both detectors sound an alarm when smoke is present in the lab?
- What is the probability that one of the detectors sound alarm when smoke is present in the lab?

QUESTION THREE:

- Explain one similarity and one difference between Mean and Median (2mks)
- An experiment was done to look at the effect of position on level of diastolic blood pressure. In the experiment 20 individuals had their blood pressure measured while lying down with their arms on their sides and again standing with their arms supported at heart level.

	Blood Pressure(mmHg)		Blood pressure(mmHg)	
	Recumbent, arm at side	Standing, arm at heart level	Recumbent, arm at side	Standing, arm at heart level
1	71	79	78	80
2	74	76	80	76
3	72	68	70	84
4	68	72	88	90
5	64	62	58	58
6	60	56	76	68
7	70	70	72	68
8	74	76	78	76
9	82	90	78	70
10	58	60	86	88

- i) Compute arithmetic mean and median for the diastolic blood respectively taken in different position. (15mks)
- ii) Based on results in above, comment on the effect of position on the level of diastolic blood pressure. (3mks)

QUESTION FOUR:

- a) Explain two ways by which histogram differs from bar graphs (2mks)
- b) The table below shows distribution of a stigmatism in 30 young men aged 18-22 years, who were accepted for military service in Kenya. Assume that a stigmatism is rounded to the nearest 10th of a diopter and that each subject in a group has the average stigmatism within that group.

Degree of a stigmatism diopters	Frequency
0.1-1.0	3
1.1-2.0	7
2.1-3.0	4
3.1-4.0	10
4.1-5.0	4
5.1-6.0	2

- i) Plot a histogram to illustrate these data (5mks)
- ii) Determine the mode (3mks)
- iii) Compute the standard deviation (10mks)

QUESTION FIVE:

- a) Explain what is meant by “Ogive” (1mk)
- b) The table below shows a grouped frequency distribution data of birthweight (oz) from 100 consecutive deliveries.

Group interval	Frequency
29.5-39.5	5
39.5-49.5	10
49.5-59.5	11
59.5-69.5	19
69.5-79.5	17
79.5-89.5	20
89.5-99.5	12
99.5-109.5	8

Use the above data to

- i)** Draw an ogive
- ii)** Estimate the median
- iii)** Estimate upper and lower quartiles
- iv)** Obtain the interquartile range
- v)** Obtain semi-interquartile range.

(19mks)