



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY**

(MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2020/2021 ACADEMIC YEAR

Third YEAR, FIRST TRIMESTER END OF TRIMISTEREXAMINATIONS

FOR THE DEGREE

OF

**BACHELOR OF SCIENCE IN HEALTH PROFESSIONS EDUCATION, BACHELOR OF
SCIENCE IN PHYSIOTHERAPY AND BACHELOR OF SCIENCE IN CLINICAL MEDICINE
AND SURGERY**

COURSE CODE: HPE 222,HPE 205,HPE 301

COURSE TITLE: MEDICAL BIOSTATISTICS

DATE:

TIME : 3HRS

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over.

SECTION A-MCQS (20 MARKS)

1. Which one of the following is not a continuous variable.

- a) Sex
- b) Height
- c) Diastolic blood pressure
- d) Temperature

2. Which one of the following statements is not true about quantitative discrete variables.

- a) Can take only integer values (whole numbers)
- b) Takes only positive values
- c) Is usually obtained by counting
- d) Examples are height, weight, blood pressure reading

3. The stages of a malignant disease (cancer) is recorded using symbols 0, I, II, III, IV. This scale of measurement is

- a) Alphanumeric
- b) Numerical
- c) Ordinal
- d) Nominal.

4. Gender, age-class, religion, type of disease, and blood group are measured on.

- a) Nominal scale of measurement
- b) Ordinal scale of measurement
- c) Interval scale of measurement
- d) Ratio scale of measurement

5. Which one of the following is not a characteristic of normal distribution ?

- a) Symmetric
- b) Bell-shaped
- c) Mean = median = mode
- d) Negative skewness

6. Complete correlation between height and weight is best given by:

- a) -1
- b) +1

- c) 0
- d) Infinity

7. Skewness is a measure:

- a) Of the asymmetry of the probability distribution
- b) That decides the distribution
- c) May have high or low variance
- d) Of central tendency

8. Consider the following data: 1, 3, 4, 5, 5, 6, 7, 11.

What is the value of the first quartile (Q1)?

- a) 3.5
- b) 3
- c) 6.5
- d) 5

9. The sum of the percent frequencies for all classes will always equal

- a) The
- b) The number of classes
- c) The number of items in the study
- d) 100

10. In a sample of 400 staff in a KNH, 40, or 10% are physiotherapists. Based on the above information, the hospital's paper reported that "10% of all the staff at the hospital are physiotherapists." This report is an example of

- a) A sample
- b) A population
- c) Statistical inference
- d) Descriptive statistics

11. Which of the following is not a measure of dispersion?

- a) The range
- b) The 50th percentile
- c) The standard deviation

d)The interquartile range

12. The descriptive measure of dispersion that is based on the concept of a deviation about the mean is

a)The range

b)The interquartile range

c) Both a and b

d)The standard deviation:

13. By which other name is the chi square goodness of fit test known?

a) Directional chi-square

b) One sample chi-square

c) Two sample chi-square

d) Chi-square Anova

14. Which row could you normally consult to find your chi- square test for independence all assumptions being met.

a) A .Pearson chi square

b) B .Likelihood ratio

c) Fishers exact test.

d) Continuity of correction.

15.In the analysis of variance (ANOVA),factors refer to.

a) The dependent variable.

b) The independent variable.

c) Different levels of treatments.

d) The critical value of F

16. In which approach to probability the outcomes are equally likely to occur?

a) Classical Probability

b) Subjective Probability

c) Relative Frequency

d) Independent

17. The special rule of multiplication of probability, the events must be:

a) Independent

b) Mutually exclusive

c) Bayesian

d) Empirical

18. Which of the following is not a correct statement about a probability.

- a) It must have a value between 0 and 1
- b) It can be reported as a decimal or a fraction
- c) A value near 0 means that the event is not likely to occur/happens
- d) It is the collection of several experiment

19. Normal Distribution is

- a) None
- b) PLatykurtic
- c) Mesokurtic
- d) Leptokurtic

20. If $X \sim N(16, 49)$, then mean is

- a) 7
- b) 49
- c) 16
- d) 4

SECTION B –SHORT ESSAYS (40 MARKS).

Answer all questions

1. Suppose a researcher, interested in obtaining an estimate of the average level of some enzyme in a certain human population, takes a sample of 10 individuals, determines the level of the enzyme in each, and computes a sample mean of 22. Suppose it is further known that the variable is approximately normally distributed with a variance of 45. Estimate the 95% confidence interval for the population mean (5marks)

2. The weight of men has a bell-shaped distribution with a mean of 69.0 kg and a standard deviation of 2.8 kg. What percentage of men has weights between 65.4 kg and 72.3 kg? Use the normal distribution table. (4 marks)

3. The following are weights of 10 HPE students; 55, 102, 65, 68, 85, 72, 85, 88, 79, 80.

Calculate? (8 marks)

- a) Mean, Median, Mode
- b) Variance
- c) Standard deviation

4. The following are Ages of 12 BSc Physiotherapy and Clinical Medicine students;

25, 21, 35, 23, 28, 22, 25, 24, 18, 29, 20, 26.

Calculate? (7 marks)

- a) Q1 and Q3
- b) IQR
- c) Construct a Box plot

5. In a Rural Dispensary an average of 3 out of every 5 patients aged 70 and above years request for inclusion of an injection in their treatment. A random sample of 10 patients were selected. Find the probability that; (8 marks)

- a) Exactly 6 request for an injection.
- b) Less than 9 request for an injection.

6. The two types of sampling are probability and non-probability. For each list their methods of sampling. (8 marks)

SECTION C (40 MARKS)

1. The following are grouped data from a study which was done to ascertain the ages of the patients who attended Mater hospital physiotherapy clinic with back problems, in the year 2019.

<u>Age</u>	<u>Number</u>
<u>20-29</u>	<u>25</u>
<u>30-39</u>	<u>84</u>
<u>40-49</u>	<u>103</u>
<u>50-59</u>	<u>80</u>
<u>60-69</u>	<u>75</u>
<u>70-79</u>	<u>63</u>
<u>80-89</u>	<u>22</u>
<u>90-99</u>	<u>18</u>
<u>Total</u>	<u>470</u>

- a) For the data above, construct a relative frequency distribution, cumulative frequency distribution and a cumulative relative frequency distribution tables (10 marks)
- b) Compute the mean, median and mode (10 Marks)

2. Covid -19 pandemic has brought about congestion in most of the hospital. This has led the health ministry to select specific hospitals to be isolation centres. Kakamega Referral Hospital is one of them. Suppose the average number of patients admitted on each day is 5. What is the probability that the hospital will admit: (20 Marks)?

- a) Fewer than four patients on the next 1-day clinic? (10 Marks)
- b) At least four patients on the next day 1- day clinic? (8 Marks)
- c) At most two patients on the next day 1- day clinic? (2 marks)

HPE222,301,205: MEDICAL EPIDEMIOLOGY (3 Units)

Purpose of the Course

The course is designed to enable the student have a background in epidemiologic principles and methods in the prevention of illness and maintenance of health of a community.

Expected Learning Outcomes

At the end of the course the student should be able to:-

- Describe and define epidemiology
- Understand the scope of epidemiology
- Describe concepts of epidemiology
- Describe and use measurements of morbidity and mortality
- Identify sources of data on community health.
- Appreciate analytic studies
- Understand population dynamics and health.

Course Content:

Definition; population and epidemiology; health and diseases; measurements of morbidity and mortality; sources of data in community health; analytic studies – retrospective, prospective and

historical; choice of study methods – case control studies, clinical trials, descriptive studies, cross

sectional studies and cohort studies; problems in aetiological.

Mode of Delivery

- Lectures
- Demonstrations
- Tutorial
- Discussions
- Instructional Material
- Field visits
- Flip Charts
- Audio-visuals equipment
- Chalkboards
- Handouts

Course Assessment

- Examination 70%