AMREF INTERNATIONAL UNIVERSITY

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF HEALTH SYSTEMS MANAGEMENT AND DEVELOPMENT

BSc IN HEALTH SYSTEMS MANAGEMENT AND DEVELOPMENT

SUPPLEMENTARY/SPECIAL EXAMS – MARCH 2024

UNIT CODE: CHP 211/HMD 133
UNIT NAME   Biostatistics
DATE: **March** 2024
TIME: <mark>TWO Hours</mark>   **Start:**   **Finish**

INSTRUCTIONS

1. This exam is marked out of 70 marks
2. This Examination comprises TWO Sections
   Section A: Compulsory Question (30 marks)
   Section B: Long Answer Questions (40 marks)

SECTION A: COMPULSORY (30 Marks)

1) Highlight one reason why median is a better measure of central tendency (2 Marks)

2) The owner of a small company has 15 employees. Five employees earn $25,000 per year, seven earn $30,000, three earn $40,000, and all the owner's annual salary is $153,000.

   a. Calculate the mean and median salaries (2 Marks)

   b. If the owner's salary is increased by $80,000, find the mean and median salaries (3 Marks)

3) Define the term conditional probability (2 Marks)

4) Outline FOUR conditions of a probability (4 Marks)

5) Two hundred (200) businessmen were asked to indicate their qualifications and the type of news they generally prefer to read. The results cross-classified data by level of education and the type of news preferred were found as tabulated below;

Type of News	Undergraduate (U)	Graduate (G)	Postgraduate (P)	Total
Political news (A_1)	10	15	5	30
General News (A_2)	25	10	15	50
Business news (A_3)	20	50	10	80
Sports and other (A_4)	5	25	10	40
Total	60	100	40	200

Find;

   a. P(U) (1 Mark)
   b. P (A_3) (1 Mark)
   c. P (A_3 U G) (2 Marks)
   d. P($A_2 \cap P$) (2 Marks)

6) Highlight FOUR properties of binomial distribution (4 Marks)

7) Differentiate between Type *1* and Type *11* error (2 Marks)

8) A coin is tossed 6 times. How many outcomes comprise the sample space (2 Marks)

9) The following data consists of tenants in 45 apartments.

Test scores	No of students
5-15	2
15-25	0
25-35	8
35-45	36
45-55	110
55-65	78
65-75	66

a) Construct a cumulative frequency distribution table (3 Marks)

SECTION B: ANSWER <u>ANY TWO (2)</u> QUESTIONS (40 Marks)

10) The following data consists of tenants in 45 apartments.

Test scores	No of students
5-15	2
15-25	0
25-35	8
35-45	36
45-55	110
55-65	78
65-75	66

Calculate;

a) Mean (2 Marks)
b) Median (3 Marks)
c) Mode (3 Marks)
d) Standard Deviation (5 Marks)
e) Variance (4 Marks)
f) Coefficient of variation (3 Marks)

11) Describe FIVE reasons why we study biostatistics (20 Marks)

12) The following data describe numbers of children with different sized palatine tonsils and their carrier status for Strep. Pyogenes

	Tonsils	
	Not enlarged	Enlarged
Carriers	19	29
Non-carriers	497	269

Using a 95% Confidence Level, determine the association between the classifications, i.e. between tonsil size and Strep. Pyogenes carrier status (20 Marks)