



# THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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**MAIN EXAMINATION**

**SEPTEMBER –DECEMBER 2021**

**FACULTY OF SCIENCE**

**DEPARTMENT OF COMMUNITY HEALTH AND DEVELOPMENT**

**REGULAR PROGRAMME**

**HBMS 103: MEDICAL STATISTICS**

**Date: DECEMBER 2021**

**Duration: 3 Hours**

**INSTRUCTIONS: PROVIDED FOR IN THE SECTIONS**

## **SECTION A – ANSWER ALL QUESTIONS. (30 MARKS)**

1. Define the following terms as used in biostatistics **(10 marks)**
  - a) Biostatistics
  - b) Sample
  - c) compound event
  - d) Measurement
  - e) Sample space
2. Most graduate schools of business require applicants for admission to take the Graduate Management Admission Council's GMAT examination. Scores on the GMAT are roughly normally distributed with a mean of 527 and a standard deviation of 112. What is the probability of an individual scoring above 500 on the GMAT? **(4 marks).**
3. The length of human pregnancies from conception to birth approximates a normal distribution with a mean of 266 days and a standard deviation of 16 days. What proportion of all pregnancies will last between 240 and 270 days (roughly between 8 and 9 months)? **(4 marks)**
4. The average number of acres burned by forest and range fires in a large New Mexico county is 4,300 acres per year, with a standard deviation of 750 acres.

The distribution of the number of acres burned is normal. What is the probability that between 2,500 and 4,200 acres will be burned in any given year? **(4 marks)**

5. In a health study of its employees, a large national manufacturer took a random sample of 60 employees who, at some time during the past three months, either failed to report to work or, once there asked to be permitted to go home. If 39 of these employees gave headaches as the cause of their non-attendance or request to go home.
- Estimate a 99% confidence interval for the true proportion of employees' absences or requests to go home that can be attributed to headaches. **(4 marks)**
  - Estimate a 95% confidence interval for the true proportion of employees absences or requests to go home that can be attributed to headaches **(4 marks).**

**SECTION B: ANSWER ALL QUESTIONS**

6. Student take a course on fundamentals of biostatistics obtained the following marks in the end of module examination:  
 Male students: 43, 55, 65, 45, 73, 68, 69, 76, 38, 63, 66, 55  
 Female students: 45, 78, 72, 66, 65, 59, 53, 47, 38, 54

Determine;

- The number of students in the class (N) **(2 Marks)**
  - Determine the mean, median and mode for male students **(6 Marks)**
  - Determine the mean median and mode for female students **(6 Marks)**
  - Determine the mean, median and mode for the whole class (male and female) **(6 Marks)**
7. The following data represents the age distribution of a sample of 100 people covered by health insurance (private or government). The sample was taken in 2003.

Age	Number
25 - 34	23
35 - 44	29
45 - 54	28
55 - 64	20

- a. Determine the first quartile (5 Marks)
- b. Determine the second quartile (5 Marks)
- c. Determine the interquartile range (5 Marks)
- d. Find the approximated median (5 Marks)

**\*END\***

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