



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Applied & Health Sciences

DEPARTMENT OF MATHEMATICS & PHYSICS

DIPLOMA IN ENVIRONMENTAL HEALTH (DEH 09J)
DIPLOMA IN COMMUNITY HEALTH & HIV MANAGEMENT (DCH 09J)

AMA 2201: BIostatISTICS

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: OCTOBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*

This paper consists of **FIVE** questions

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

This paper consist of **THREE** printed pages

QUESTION ONE (30 MARKS)

- a) Explain **FOUR** measures of dispersion (8 marks)
- b) Explain **FOUR** measures of central tendency (8 marks)
- c) A problem in biostatistics is given to five students A, B, C, D and E. Their chances of solving it are $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{6}$. What is the probability that the problem will be solved (5 marks)
- d) State **FOUR** methods of random sampling methods (4 marks)
- e) Differentiate between census and sample (4 marks)
- f) Define statistics (1 mark)

QUESTION TWO (20 MARKS)

A departmental store gives in-service training to its salesman followed by a test to consider whether it should terminate the services of any of the salesmen who does not qualify in the test. The data in the table below gives the test scores and sales made by nine salesmen during a certain period.

Test score (X):	14	19	24	21	28	22	15	20	19
Sales turns (Y):	31	36	48	37	50	45	33	41	39

- a) Determine the Arlova table for the straight line regression of sales on test scores (16 marks)
- b) Test for the significance of the straight lien regression using an f-test at 56 (4 marks)

QUESTION THREE (20 MARKS)

- a) The data below gives analysis of patients' weights admitted in three different hospitals in Mombasa District. Study it carefully and answer question (a)

	Hospital A	Hospital B	Hospital C
No. of in patients	100	150	250
Arithmetic Mean	50	55	60
Variance	100	121	144

Calculate the:

- (i) Combined Arithmetic mean (3 marks)
 - (ii) Combined Standard deviation (5 marks)
- b) Under what conditions is the Standard Deviation preferred measure of dispersion? (2 marks)
 - c) A child welfare officer asserts that the mean sleep of young babies is 14 hours a day. A random sample of 64 babies shows that their mean sleep was only 13 hours 20 minutes, with a standard deviation of 3 hours. At 5% of significance test the assertion that mean sleep of babies is less than 14 hours a day. (10 marks)

QUESTION FOUR (20 MARKS)

The population of Rose plants in a given nursery is 4. With heights 1cm, 2cm and 4cm. Eunice decides to select a random sample without replacement (RSWOR) of size 2.

- (i) How many samples can she get? (1 mark)
- (ii) What is the probability of obtaining each sample (1 mark)
- (iii) For each sample selected, evaluate the sample mean (\bar{x}) and sample variance (S^2) (18 marks)

QUESTION FIVE (20 MARKS)

a) The following distribution gives the difference in age between husband and wife in a particular community.

Difference in age	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	449	705	507	281	109	52	16	4

Calculate

- (i) The arithmetic mean (4 marks)
 - (ii) The mean deviation (6 marks)
- b) Calculate the standard deviation (6 marks)
- c) Under what condition is range preferred measure of dispersion (2 marks)
- d) Under what condition is mean deviation the preferred measure of dispersion (2 marks)