



TECHNICAL UNIVERSITY OF MOMBASA
Faculty of Applied & Health
Sciences

DEPARTMENT OF MATHEMATICS & PHYSICS
DIPLOMA IN BUILDING & CIVIL ENGINEERING

AMA 2251: ENGINEERING MATHEMATICS IV

END OF SEMESTER EXAMINATION

SERIES: APRIL 2014

TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions

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

Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

a) In 2010, five public companies reported the following end of year profits in millions of shillings:

0.5, 0.7, 10, 0.2, 0.4

An interested investor has approached you and wants to know the average profits for these firms miss Mwangangi and Mr Odhiambo gave the average values of shs 0.5million and shs 2.36 million respectively.

Required:

Whose average value (Mwangangi or Odhiambo) is more appropriate in this case? and why?

(5 marks)

b) State any FIVE characteristics of a good measure of dispersion.

(5 marks)

c) Compute coefficient of variation from the following data. (Ans correct to 1 d.p)

(10 marks)

Per day (kshs)	No of Employees
300 – 399	30
400 – 499	46
500 – 599	58
600 – 699	76
700 – 799	60
800 - 899	50
900 – 999	20

d) Required: (i) Show the above data on a bar graph then

(6 marks)

(ii) Construct a frequent polygon

(2 marks)

(iii) Calculate the range and coefficient of range

(2 marks)

Question Two

The managers of an import agency are investigating the length of time that customers take to pay their invoices, the normal terms for which are 30 days net. They have checked the payment records of 100 customer chosen at random and have compiled the following data:

Payment in Days	No. of Customers
5 – 9	4
10 – 14	10
15 – 19	17
20 – 24	20
25 – 29	22
30 – 34	16
35 – 39	8
40 – 44	3

Required:

- a) Calculate the arithmetic mean
- b) Calculate the standard deviation
- c) Construct a histogram
- d) Calculate D_7

Question Three

Processing of data implies editing, coding, classification and tabulation. Describe in brief these 4 operators pointing out the importance in data collection.

Question Four

The following scores were obtained by 30 students in a statistics test.

46	31	18	39	40	38
37	19	15	26	14	37
24	41	18	19	21	25
31	10	20	21	32	46
20	30	32	27	31	37

- a) Use the above scores to prepare a grouped frequency distribution using a class interval size 5 starting with 10 – 14 as your lowest class.
- b) Calculate the median, mean and std deviation of the grouped data.

Question Five

- a) Statistical analysis seeks to provide summary measures which describe the important characteristics of a distribution of values. Discuss in details average, dispersion, skewness and kurtosis as the important characteristics of distributions. (use illustrations where appropriate) **(12 marks)**
- b) Calculate standard deviation and variance of the following data: **(8 marks)**

5, 8, 15, 29, 47, 47, 64, 71, 74