THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

**UNIVERSITY EXAMINATION FOR DEGREE IN
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY (BSc. I. T. 9S)**
(YR III, SEM I)

AMA 2103 : PROBABILITY & STATISTICS

END OF SEMESTER EXAMINATIONS

SERIES : AUGUST/SEPTEMBER 2011

TIME : 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
- *Answer Booklet*

This paper consist of **FIVE** questions in **TWO** sections **A** & **B**
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question is as shown
This paper consists of **THREE** printed pages

<u>**SECTION A (**</u>*Compulsory*<u>**)**</u>

Question 1

a) Explain the following terms:

    (i)   Trial and event
    (ii)   Sample space
    (iii)   Mutually exclusive events   (6

       marks)

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b) Two dice are thrown. What is the probability that a double (both dice showing the same score)   is obtained?   (6 mark)

c) A shopkeeper buys a particular kind of light bulb from three manufacturers A_1, A_2, and A_3. She buys 30% of her stock from A_1, 45% from A_2 and 25% from A_3. In the past she found that 2% of A_3's bulbs are faulty whereas only 2% of A_1's and A_2's are. Suppose she chose a bulb and finds it faulty, what is the probability that was manufactured by:

     (i) A_1
     (ii) A_2
     (iii) A_3 (11 marks)

SECTION B (*Attempt any TWO questions*)

Question 2

a) Define a "random variable"   (3 marks)

b) The number of Persons x, in a Singapore family chosen at random has the following probability distribution.

X	1	2	3	4	5	6	7	8
P(x)	0.34	0.44	0.11	0.06	0.02	0.01	0.01	0.01

    Find: (i)   The average family size

            (ii)   The variance   (14 marks)

c) Explain any **THREE** measures of central tendency   (6 marks)

Question 3

(a) Define correlation   (2 marks)

(b) The following are the scores of students in paper 1 and paper 2 for a certain subject.

Student	x, marks in paper 1	y, marks in paper 2
A	42	31
B	84	83
C	50	42
D	42	60
E	33	28
F	50	63
G	69	59
H	81	92

I	50	73
J	35	40

    Determine the correlation coefficient   (12 marks)

c) Using the method of least squares, derive the normal equations for the equation: (9 marks)

$$Yi = \propto$$

Question 4

a) Explain any **FIVE** measures of dispersion   (10 marks)

b) The distribution of goals scored by an amateur football team during two seasons is shown below

No. of goals	1	2	3	4	5	6	7	8	9	10
No. of times	2	3	8	4	4	3	6	3	2	1

    Calculate the mean and standard deviation   (10 marks)

Question 5

The data below was obtained from an experiment to measure the extension of a spring when loaded with different weights

X: load (newtons)	Y: length of spring (cm)
0.1	10.7
0.2	11.3
0.3	12.0
0.4	12.4
0.5	13.0
0.6	13.7
0.7	14.5
0.8	15.1
0.9	15.6
1.0	16.0

a) Calculate the regression line of Y on X (20 marks)

b) Predict the load for 0.65N   (3 marks)