MOMBASA POLYTECHNIC

UNIVERSITY COLLEGE

PROBABILITY AND STATISTICS 1-   SMA 2103

Bachelor of Science in Information Technology

Third Year First Semester

Instructions: Answer any three questions

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1(a)   Explain the following terms:

   i.   Trial and event
   ii.   Sample space
   iii.   Mutually exclusive events   **[6 mks]**

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

(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.   A1
   ii.   A2
   iii.   A3   **[11 mks]**

2(a)   Define a "random variable"   **[3 mks]**

(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 mks]**

c)Explain any three measures of central tendency.
      [6marks]

3 (a) Define correlation
      [2marks]

(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   [12marks]

Using the method of least squares, derive the normal equations for the equation

$Y; = \alpha + \beta x; + e;$ [9marks]

4. (a) Explain any 5 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 means and standard deviation   [13marks]

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

X; load (newtons)	yh 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.   [20marks]

b) Predict the load for 0.65N   [3marks]