THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING

AMA 3106: STATISTICS

END OF SEMESTER EXAMINATION

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

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

This paper consists of **FIVE** questions in **TWO** sections: **A** and **B**
Answer question **ONE** is compulsory from Section A and any other **TWO** questions from section B
Maximum marks for each question are as shown
This paper consists of **THREE** printed pages

SECTION A - COMPULSORY

Question 1

a) Three groups of children contain respectively 3 girls and 1 boy, 2 girls and 2 boys, 1 girl and 3 boys. One child is selected at random from each group.

   Show that the chance that the 3 selected consists of 1 girl and 2 boys is 13/32   (17 marks)

b) How many different signals can be made from seven different flags if four flags are displayed in a row   (6 marks)

c) An automobile dealer has 3 Fords, 2 Toyotas and four Nissans to place in the front row of his car lot. In how many different ways by make of car can he display the automobiles   (7 marks)

SECTION B *(Answer any TWO questions)*

Question 2

$$\frac{E(O-E)^2}{E} = \frac{E(O^2)}{E} - N$$

a) Prove that   **,** where O are observed frequencies E are expected frequencies N is the total of O and total of E.

   i.e. N = O = E

b) The figure given below are

   (i)   The theoretical frequencies of a distribution
   (ii)   The frequencies of the distribution having the same mean, standard deviation and total frequencies as in (i)

| 1 | 12 | 66 | 220 | 495 | 792 | 924 | 792 | 495 | 220 | 12 | 1 |
| 2 | 15 | 210 | 484 | 799 | 943 | 799 | 484 | 210 | 66 | 15 | 5 |

   Do you think that the normal distribution provides a good fit to the data   (15 marks)

Question 3

Compute:

a) Standard deviation   (3 marks)

b) Coefficient of variation   (4 marks)

From the following data

Marks	0 - 10	10 – 20	20 – 30	30 – 40	40 - 50
No of Students	7	6	15	12	10

c) In how many ways can 6 persons be chosen out of 8 (3 marks)

d) A candidate is selected for interview of management trainees for 3 companies. For the first company, there are 12 candidates for the second there are 15 candidates and for the third there are 10 candidates. What are the chances of his getting at least at one of the companies

(10 marks)

Question 4

a) The mean of a binomial distribution is 40 and standard deviation 6. Calculate n, p, q (6 marks)

b) The incidence of occupational disease in an industry is such that the workers have a 20% chance of suffering from it. What is the probability that out of six workers, four or more will contract the disease. (14 marks)

Question 5

Calculate the regression equations of X and Y on X from the following data (20 marks)

X	1	2	3	4	5
Y	2	5	3	8	7