THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING

EBC 2206: STATISTICS

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY/JUNE 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions
Maximum marks for each part of a question are clearly shown
This paper consists of **THREE** printed pages

SECTION I (Compulsory – 30 marks)

Question 1 (30 marks)

a) Find the mean of the frequency distribution given in the table below

Variable	X	513	514	515	516	517	518	519	520	521
Freq	F	3	4	7	9	13	10	8	6	2

b) The breaking strengths of 26 steel bans was recorded in the following table

Breaking Strengths (N/m^2)

36.7	65.9	38.2	37.6	38.2	38.2	38.2	41.0
35.8	36.4	37.3	36.5	38.5	38.5	36.5	41.4
37.9	36.7	36.6	34.5	39.7	39.7	37.1	
38.3	36.5	36.8	38.1	35.5	35.5	33.3	

(i) Form a frequency table of the data (10 marks)
(ii) Represent the data in the form of a frequency polygon (3 marks)
(iii) Calculate the mean (5 marks)

c) What is the probability that a storm with a return period of 20 years will occur once in a 10 year period. (7 marks)

SECTION II (Answer any TWO questions)

Question 2 (20 marks)

On a certain stream the probability that the maximum peak flow during a 1year period will be less than 500cfs is 0.2 and the probability that it will be between 5000 cfs and 10,000 cfs is 0.4. In a 20 year period what is the probability of 4 peak flow:

a) Less than 5000cfs (8 marks)
b) 8 peak flows between 5000 and 10,000 cfs (12 marks)

Question 3 (20 marks)

i) Assume that during a certain November, 10 rainy days occurred.
Also assume that at this particular location the occurrence of rain on any day is independent of whether or not it varied on any previous day.

A sample of 5 days is selected at random and then climatic data analysed

What is the probability that
(a) 3 of these days were raining (7 marks)
(b) Less than 3 of these days were raining (6 marks)

(ii) What is the probability that the 4^{th} occurrence of a 10 year flood will be on the 40^{th} year (7 marks)

Question 4 (20 marks)

a) My son is to meet me by given time.
The probability of his being punctual if he travels by bus is 0.2, if he travel by train is 0.5 and if he is given a lift in the neighbours car 0.9. The probabilities of him travelling by bus train and can are 0.3, 0.4 and 0.3 respectively.

What is the probability that he will be on time (10 marks)

b) The probability of my arriving at work less than 5 minutes late is 0.7 and of arriving 5 or more minutes late is 0.2.
If I am less than 5 minutes late the probability of a reprimand is 0.4 while if 9m 5 or more minutes late is 0.9.

(i) What is the probability that I will avoid a reprimand tomorrow (5 marks)
(ii) If I got a reprimand today, what is the probability that I was less than 5 minutes late (5 marks)

Question 5 (20 marks)

A 1,000 marble sample is taken from a large population in which the probability of selecting a red marble is 0.012. Using the poisson distribution calculate the probabilities of selecting a no red marble 1, 2, 3, 4 and 5 red marbles (20 marks)