THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY

(DIT2K9J & DIT09M)

ECS 2311: QUANTITATIVE TECHNIQUE IV

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: FEBRUARY/MARCH 2012
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*
- ***Calculator*** *and* ***SMP Tables*** *can be used*

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 are as shown
This paper consists of **THREE** printed pages

SECTION A (COMPULSORY)

QUESTION ONE

a) State **FOUR** stages involved in building a simulation run: (4 marks)

b) Describe the following types of simulation:
   i. Continuous
   ii. Discrete
   iii. Analogue (6 marks)

c) Explain the following components of the cost of holding stock:
   i. Storage cost
   ii. Cost of capital factor (4 mark)

d) Explain the term level of significance as applied in hypothesis testing. (2 marks)

e) The mean life of a random sample of 50 similar torch bulbs drawn from a batch of 500 bulbs is 72 hours. The standard deviation of the life time of sample was found to be 10.4 hour. A batch is classified to be inferior if the mean life of the batch is less than the population mean of 75 hours.

   Determine whether as a result of the sample the batch can be considered inferior at a level of significance of I. 5% (4 marks)

SECTION B (Answer any two questions)

QUESTION TWO

a) Explain the use of random numbers in simulation. (2 marks)

b) State **FOUR** advantages of simulation. (4 marks)

c) The schedule of vehicles arriving at a big garage per day for service was recorded as follows:

Number of vehicles	0 - 6	7 - 9	10 - 16	17 - 19	20 - 26	27 - 27	30 - 36
Number of days	9	14	17	22	10	5	3

i. Using the following random numbers, 9359, 9582, 9900, 1007, 4849, 9522, 6639, 2212, 3732, simulate the number of vehicles arriving at the garage.

ii. Calculate the expected number of vehicles arriving per day. Give the answer to the nearest whole number. (11 marks)

QUESTION THREE

a) i) Define the term "Statistical hypothesis. (2 marks)
ii) Outline **two** types of hypothesis tests. (2 marks)

b) In a Location X with 400 people 48% preferred using small size computers, while in location Y with 300 people, 56% preferred using small size computers. Test whether there is a difference between the proportions in location X and Y at the 5% level of significance. (10 marks)

c) Differentiate between Critical value and Test statistic. (3 marks)

d) State the procedure to be followed in hypothesis testing. (3 marks)

QUESTION FOUR

a) Define the following terms as used in inventory control systems.
i. Order cost
ii. Carrying cost
iii. Zero lead time (6 marks)

b) The yearly requirement of a manufacturer is 1,000 units of a part that is used at a uniform rate throughout the year. The machine set-up cost per lot is ksh. 30,640 while production cost is ksh. 3,900per unit. Interest, insurance and taxes are estimated at 12% on average on average. The cost of storing the parts is estimated at ksh. 612 per unit per year.

i. Calculate the economic batch quantity
ii. Calculate the total stock holding cost. (14 marks)