



**THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE**

**(A Constituent College of JKUAT)**

(A Centre of Excellence)

# **Faculty of Engineering & Technology**

**DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY**

**DIPLOMA IN COMMUNICATION INFORMATION TECHNOLOGY**

**DIPLOMA IN INFORMATION TECHNOLOGY**

(DICT 10M & DIT)

**EIT 2306: QUANTITATIVE TECHNIQUE I**

**SPECIAL/SUPPLEMENTARY EXAMINATION**

**SERIES: OCTOBER 2012**

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*
- *Calculators and SMP Tables*

This paper consist of **FIVE** questions  
 Answer question **ONE** 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 (20 marks)**

- a) Explain the following terms as applied in estimation.
  - i) Population parameter
  - ii) Statistic **(4 marks)**
  
- b) Explain the following types of distributions:
  - i) Normal distribution
  - ii) Poisson distribution **(4 marks)**
  
- c) The probability of getting a defective resistor from a supplier is 0.03. The resistors are packed in boxes each containing 100 resistors. Calculate the probability of getting at most 2 defective resistors. **(4 marks)**
  
- d) In a random sample of 200 garages it was found that 79 sold car batteries at prices below that recommended by the manufacturer.
  - i) Estimate the proportion of garages selling above the recommended price.
  - ii) Establish the 95% interval estimate of the proportion of garages selling below the recommended price. **(4 marks)**
  
- e) Describe the following terms:
  - i) Scatter diagram
  - ii) Correlation coefficient **(4 marks)**

**SECTION B (Answer Any Two Questions)**

**Question Two (20 marks)**

- a) Define the following terms as used in estimation:
  - i) Interval estimate
  - ii) Correlation
  - iii) Population **(6 marks)**
  
- b) The table below shows the marks scored by students in Mathematics and Quantitative Methods (QM) at O-level and diploma respectively. Use it to answer the questions that follows:

Students	A	B	C	D	E	F	G	H	J	K
Mathematics	55	35	30	80	45	25	60	45	20	85
QM	35	50	20	65	40	45	50	60	25	70

- i) Calculate the Pearson’s product moment co-efficient of correlation and interpret the results. **(10 marks)**
- ii) Calculate the coefficient of determination for the data. **(2 marks)**
- iii) Draw a conclusion using the coefficient of determination obtained in (ii) above. **(2 marks)**

**Question Three (20 marks)**

- a) A multinational company has 100,000 computers whose standard deviation is 35. Random samples of 6000 computers each are selected. Find the standard error of the samples. **(4 marks)**
- b) (i) During a normal day, the average number of lorries that unload at a depot is 3 using poisson Distribution. Find the probability that in any hour at most 2 lorries will arrive to unload. **(5 marks)**
- (ii) A farmer packs oranges in crates each containing 250 on average, 0.6% of the oranges are found to be bad when the crates are opened. Using poisson distribution find the probability that in a given crate there will be 2 bad oranges. **(4 marks)**
- c) A company published a new College textbook last year. Before the company decided at which price to sell the textbook, it had to know the average price of all such textbook in the market. The research department took a sample of 36 of such textbook and collected information on their prices. This information produced a mean price of shs 48.40 for the sample. The standard deviation of all the textbooks is shs. 4.50.
- i) State the point estimate of the mean price for the textbooks
- ii) Construct the 90% confidence interval for the mean of the textbooks. **(7 marks)**

**Question Four (20 marks)**

- a) Explain the following terms with regard to regression analysis.
- i) Regression
- ii) Scatter diagram
- iii) Gradient **(6 marks)**
- b) The table below shows the height and weight of a random sample of 10 patients. Use it to answer the questions that follows:

Patient	A	B	C	D	E	F	G	H	J	K
Height in inch	62	64	66	68	70	72	74	76	78	80
Height in kg	66	67	72	72	57	72	76	76	87	82

- i) Using the least squares method, determine the equation of the regression line. **(8 marks)**
- ii) Estimate the weight of whose height is 71 inches. **(3 marks)**
- iii) Interpret the gradient of the distribution. **(3 marks)**

**Question Five (20 marks)**

- a) (i) Outline **TWO** characteristics of a normal distribution. **(2 marks)**
- (ii) The performance of a particular type of UPS is normally distributed with a mean of 89 minutes and a standard deviation of 30 minutes. If the manufacture replaces all the UPS which fail before the guaranteed minimum performance of 45 minutes, determine the percentage of UPS that will be replaced. **(5 marks)**
- b) During the Safaricom IPO, 80% of the stock broking firms were positively advising their clients about the issue. Suppose John, a prospective investor contacted six stock broking firms, find the probability that at least five of them advised him positively. **(5 marks)**
- c) State and explain **FOUR** sampling methods. **(8 marks)**

