



TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
(BSIT)

AMA 2220: PROBABILITY & STATISTICS

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MARCH 2014

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions

Attempt 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

Question One (Compulsory)

- a) Define the following terms:
- (i) Sample space
 - (ii) Discrete variable
 - (iii) Mutually exclusive events **(6 marks)**
- b) A bag contains four red balls, five white balls and six black balls. If three balls are drawn at random, what is the probability that they are all the same colour? **(4 marks)**
- c) Suppose there is a school with 60% boys and 40% girls as its students. The female students wear trousers and skirts in equal number, the boys all wear trousers. An observer sees a student from a

distance and sees that the student is wearing trousers. What is the probability this student is a girl. **(6 marks)**

d) Using the data below, draw a frequency polygon curve:

Viewing Time	Number of Students
300 – 399	14
400 – 499	46
500 – 599	58
600 – 699	76
700 – 799	68
800 – 899	62
1000 – 1099	22
1100 – 1199	6

Question Two

a) Define the following terms:

- (i) Continuous random variable
- (ii) Probability distribution
- (iii) Contingency table

(6 marks)

b) The number of persons X, in a Tanzania 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

- (i) Find the average family size **(4 marks)**
- (ii) The variance of the distribution **(4 marks)**
- (iii) The coefficient of variation of X **(3 marks)**

c) State any THREE uses of graphs in statistics

(3 marks)

Question Three

a) The following data shows the number of vehicles produced per year by a certain Japanese Company.

553	526	521	528	538
523	538	546	524	544
532	554	517	549	512
528	523	510	555	545
524	519	525	543	532
533	512	521	536	534
541	535	531	551	535
519	530	549	518	531

Construct a frequency distribution for the data starting with the class 510 – 520

(5 marks)

b) Calculate:

- (i) The mean of the data **(5 marks)**
- (ii) The standard deviation of the data **(5 marks)**
- (iii) The quartile deviation of the data **(5 marks)**

(5 marks)

(5 marks)

(5 marks)

Question Four

The following area scores of students in a statistics class in mid-term and final exam as the dependent variable.

- a) Draw a scatter diagram using midterm as the independent variable and final exam as the dependent variable. **(6 marks)**
- b) Construct a regression model for the data. **(10 marks)**
- c) Predict the final score for a midterm score of 70 **(4 marks)**

Question Five

- a) A man keeps a record of all expenses incurred in running his car as shown below:

Age of car (years)	1	2	3	4	5	6	7	8	9	10
Expenses (kshs)	2000	3000	5000	8000	6000	9000	10000	13000	12000	13000

- (i) Calculate the coefficient of correlation and interpret the results. **(7 marks)**
 - (ii) Calculate the coefficient of determination and interpret the results **(3 marks)**
- b) Two teams A and B play a football match against each other. The probability of each team scoring 0, 1, 2, 3 goals are shown below:

No. of Goals	Probability of Scoring	
	A	B
0	0.3	0.2
1	0.3	0.4
2	0.3	0.3
3	0.1	0.1

Find the probability of:

- (i) A winning
- (ii) B winning **(10 marks)**