



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2018/2019 ACADEMIC YEAR
THIRD YEAR SECOND SEMESTER**

**SCHOOL OF BUSINESS & ECONOMICS
BACHELOR OF SCIENCE IN INFORMATION
SCIENCE**

COURSE CODE: INS 3203

**COURSE TITLE: QUANTITATIVE METHODS
FOR INFORMATION SCIENTISTS**

DATE: 15TH APRIL 2019

TIME: 0830AM -10.30AM

INSTRUCTIONS TO CANDIDATES

- i. Answer question ONE and any other THREE questions
- ii. Do not write on the question paper
- iii. Use illustration and diagrams where they serve to support the answers.

This paper consists of 4 printed pages. Please turn over

QUESTION ONE**(25 MARKS)**

- a) Explain each of the following
- i) Conditional probability **(3 marks)**
 - ii) Collectively exhaustive events **(3 marks)**
- b) Give the probability of each of the following :
- i) A or B when the two events are not mutually exclusive **(2 marks)**
 - ii) A and B when the two events are dependent **(2 marks)**
- c) Find the probability of tossing a coin and getting a tail then rolling a six sided die and obtaining less than four **(5 marks)**
- d) A blood bank catalogs the types of blood including positive or negative. Rh-factor given by the donors during the blood donation week. The number of donors who give each blood type in your college is listed in the following table.

Blood type

Rh-factor	O	A	B	AB	Total
Positive	156	139	37	12	344
Negative	28	25	8	4	65
Total	184	164	45	16	409

Given a donor is selected at random

Required : find the probability that the donor has

- i. Type A or B blood **(3 marks)**
- ii. Type AB and is Rh-positive **(3 marks)**
- iii. Type B given that the donor is Rh- negative **(4 marks)**

QUESTION TWO**(15 MARKS)**

- a) Show that the compounding interest amount at the end of n period (A_n) equal to $A_i(1+i)^{n-1}$ **(4 marks)**
- b) John has undertaken to invest Ksh. 200,000 with a given financial institution at an interest rate of 8% per annum.
- i) If the interest is paid into the account on a monthly basis, determine the amount accrued in the investment after six years **(4 marks)**
 - ii) Assume that the interest is for the same investment paid daily. Determine what amount will accrue after the six years period **(3 marks)**
- c) Given an investment that offers interest of 10% per annum over a period of seven years. Determine the amount you would need to invest now in order to accrue Ksh. 500,000 at the end of the seven year period. **(4 marks)**

QUESTION THREE**(15 MARKS)**

In a recent report a magazine suggested that the typical family of four with an intermediate budget spends an equivalent of Ksh. 9600 per week on food. The following frequency distribution was included as part of the report.

Amount spent	Frequency
8000 upto 8500	6
8500 upto 9000	12
9000 upto 9500	23
9500 upto 10000	36
10000 upto 10500	24
10500 upto 11000	10

- a) Based on this report determine each of the following
- i) The variance **(3 marks)**
 - ii) The standard deviation **(1 marks)**
 - iii) The Karl Pearson's coefficient of variation **(2 marks)**
- b) A recent study of the hourly wages of maintenance crews for major airlines showed that the mean after tax hourly earning was Ksh. 2,550 with a standard deviation of Ksh. 450. If we select a crew member at random. What is the probability this crew member earns
- i. Between Ksh.2000 and Ksh. 2900 **(3 marks)**
 - ii. Less than Ksh. 2,400 **(3 marks)**
 - iii. Between Ksh. 1,900and Ksh. 2,300 **(3marks)**
- If $\alpha = 0.05$

QUESTION FOUR**(15 MARKS)**

- a) Explain what is meant by skewness as applied to the study of statistics diagrammatically explaining the different types of skewness **(5 marks)**
- b) Given the distribution as 1,2,3,4,5 determine the coefficient of skewness using the statistical software approach and comment on the shape of the data **(5 marks)**
- c) Explain what is meant by Kurtosis explaining the different types of Kurtosis **(5 marks)**

QUESTION FIVE**(15 MARKS)**

Given the data of daily production of trans receivers at Nairobi electrics organized in a distribution table as below

Daily production	Frequency
80 – 90	5
90 – 100	9
100 – 110	20
110 – 120	8
120 – 130	6
130 – 140	2

Estimate each of the following

- i) The mean **(3 marks)**
- ii) The median **(4 marks)**
- iii) The mode **(4 marks)**
- iv) The interquartile range **(4 marks)**

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