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OFFICE OF THE DEPUTY PRINCIPAL

ACADEMICS, RESEARCH AND STUDENTS' AFFAIRS

UNIVERSITY EXAMINATIONS

2018 /2019 ACADEMIC YEAR

...3rd.... YEAR ...1st..... SEMESTER REGULAR EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE

ECONOMICS

COURSE CODE: ECO 313

COURSE TITLE: QUANTITATIVE METHODS I

DATE: 13/12/2019 **TIME: 8 am – 12 pm**

INSTRUCTION TO CANDIDATES

- **SEE INSIDE**

THIS PAPER CONSISTS OF 4 PRINTED PAGES **PLEASE TURN OVER**

INSTRUCTIONS TO CANDIDATES

- *Answer Question **ONE** and any other **TWO** questions*
- *Question ONE carries 30 marks*
- *Time allowed: 3 hours*

QUESTION ONE (30 MARKS)

a) A manufacturer produces three products X, Y and Z. During production, the products require the use of two machines, A and B. The number of hours neeeded on both machines are shown in the following table

	Machine A	Machine B
Product X	1 hr	1 hr
Product Y	2 hrs	1 hr
Product Z	2 hrs	2 hrs

Machine A and B can be used for 40 hours and 34 hours a week respectively. the profits per unit is sh 10, sh 15 and sh 22 for product X , Y and Z respectively.

i) Formulate the linear Programing problem **(4 Marks)**

ii) Solve the linear programming problem in a) above **(12 Marks)**

b) State and explain the assumptions for the input-output models **(6 Marks)**

c) Determine the functional dependence of the following functions

$$Y_1 = 3x_1^2 + 2x_2^2$$

$Y_2 = 5x_1 + 1$ **(8 marks)**

QUESTION TWO (20 MARKS)

a) Differentiate the following terms

i) Mutually exclusive Events and collectively Exhaustive events **(4 marks)**

ii) Sample space and experiment **(3 Marks)**

b) Solve the following three simultaneous equations using the gaussian method.

$$2X + 12Y - 2Z = 20$$
$$2X + 3Y + 3Z = 17$$
$$3X - 3Y - 2Z = -9$$ **(8 marks)**

c) Differentiate the three approaches to probability **(5 marks)**

QUESTION THREE (20 MARKS)

a) Explain the steps followed when conducting a casual - comparative research design. (10 mks)
b) Explain the main features of qualitative research paradigm. (10 mks)

QUESTION FOUR (20 MARKS)

a) Out of 3000 tires in a warehouse, 2000 are domestic and 1000 are imported. Among the domestic tires, 40 % are all season and for the imported tires, 10% are all season. If a tire is selected at random and it is all-season, what is the probability that it is imported. **(6 marks)**

b) the IQs of a large population of children are normally distributed with a mean of 100.4 and a standard deviation of 11.6.

i) what percentage of children have IQs greater than 125? **(5 Marks)**

ii) 90% of the children have IQs greater than what value? **(4 marks)**

c) A commitee has 7 members, 3 men and 4 women. In how many ways can a sub commitee of four be selected if it is to consist of exactly

i) Three men **(2 Mark)**

ii) Four women **(1 Mark)**

iii) Two men and Two women **(2 Mark)**

QUESTION FIVE (20 MARKS)

a) Discuss five probability sampling techniques in research methods. (10 mks)
b) Describe the criteria of a good research problem. (10 mks)

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