THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

SEPTEMBER – DECEMBER2020 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS&ACTUARIAL SCIENCE

REGULAR PROGRAMME

MAT 160: STATISTICS &PROBABILITY I

Date: APRIL 2020	**Duration: 2 Hours**
INSTRUCTIONS: Answer Question ONE and any other TWO Questions	

QUESTION ONE

(a) Define the following terms
   i) Statistics**1marks**
   ii) Population**1marks**
   iii) Sample**1marks**
   iv) Variable**1marks**

(b) A coin is tossed three times:

i) Draw a tree diagram to show all the possible outcomes **2marks**

ii) Find the probability of getting

i) At least one head. **2marks**

ii)No head **2marks**

(c) In an agriculture centre, the lengths of a sample of 50 maize cobs were measured and recorded as recorded as shown in the table below

Length cm	8-10	11-13	14-16	17-19	20-22	23-25
No of cobs	4	7	11	15	8	5

Calculate

(i) The mean **3marks**

(ii) Semi-inter-quartile deviation**3marks**

(iii) The variance **3marks**

(iv) The standard deviation **3marks**

(d) Determine the coefficient of skewness of the following data 11,2,4,3,6,10. (**8marks)**

QUESTION TWO

a) During a tournament the probability of Miruthu girls winning volleyball, netball, and hockey are $\frac{2}{3}, \frac{1}{5} and \frac{3}{5}$ respectively. What is the probability that Miruthu girls

i) Wins all three games? (**3marks)**

ii) Wins at least one game? **(3marks)**

iii) Wins two games (**3marks)**

b) The following table shows the results of the test done in Mathematics and Physics.

Students	A	B	C	D	E	F	G	H
Mathematics	63	72	41	56	44	89	70	45
Phyisics	48	71	50	46	35	92	42	48

Calculate the product-moment correlation coefficient and comment on the result obtained. (**11marks)**

QUESTION THREE

a) People in a village were categorized according to their behavior on Sunday (x) and also according to their level of education (y). the results are given in the contency table below

	Primary	Secondary	Tert.c	University
Home	25	37	59	40
Pubs	16	19	26	23
Church	59	43	72	81

Find the the following:

i) P(home – primary) (**2marks)**

ii) P(pubs – T.C) (**2marks)**

iii) P(pubs)**(2marks)**

iv) P(T.C/pubs)**(3marks)**

v) P(Church/Sec) **(3marks)**

b) A bag B_1 has 3 mangoes and 5 oranges and bagB_2 has 9 mangoes and 3oranges. A bag is selected where bagB_1 selected with probability of 3/5 and bagB_2 with probability 2/5. Two fruits are selected without replacement.

Draw a tree diagram and show the probability of the possible events. **(8 marks)**

QUESTION FOUR

(a) Given the set of data 15,11,8,16,7. Determine the Peakedness **(8marks)**

(b) The table below relates the variables X and Y

X	3	4	5	6	7	8	9	10	11
Y	9	18	23	29	32	31	35	42	48

Find

i) the correlation coefficient **(7marks)**

ii) The value of a and b **(5marks)**

QUESTION FIVE

a) A company employs skilled and unskilled workers. 30% are skilled workers and the rest unskilled the probability that of skilled worker will finish the job on time is 0.72 and the probability that the unskilled worker will finish on time is 0.48.
Given that a job was completed on time, what is the probability that the job was done by unskilled work?**(8marks)**

(b) Given the following set of data

class	f_i
70-74	4
75-79	8
80-84	11
85-89	15
90-94	9
95-99	3

Determine $\mathrm{SK}_1, \mathrm{SK}_2$ *and* SK_B **(12marks)**

END