CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATION
RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS
EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF EDUCATION AND BACHELOR OF SCIENCE

MATH 141: INTRODUCTORY STATISTICS

STREAMS: BSC & B.ED **TIME: 2 HOURS**

DAY/DATE: TUESDAY 10/08/2021 **11.30 A.M - 1.30 P.M.**

INSTRUCTIONS:

- Attempt **Question ALL the THREE questions**
- Do not write anything on the question paper Electronic calculators may be used

Question one (30 marks)

a) With the help of relevant examples, state and explain the four scales of measurements in statistics. (8 marks) b) Distinguish between the following terms

i). Discrete and Continuous variables (2 marks)

ii). Descriptive and Inferential statistics (2 marks)

iii). Population and Sample (2 marks)

c) An environmental study on a certain species of tree from mountain Kenya is summarised in the table given below.

Marks	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Frequency	3	18	20	17	15	5	2

Required: use the data to compute

i. the mode (2 marks)

ii. the median (2 marks)

iii. the standard deviation (3 marks)

iv. State two advantages of the median compared to the mean. (2 marks)

d) A box contains 3 red balls and 6 green balls. 3 balls are to be picked one after the other without replacement. Find the probability that;

i). Three balls picked are of the same color (3 marks)

ii). At least 2 balls picked are green (3 marks)

iii). Only one ball is red (2 marks)

Question two (20 marks)

a) . In a recent survey, 100 people were asked if they thought that the next Kenyan president should be a woman. The results of the survey is given below.

Gender	**Yes**	**No**	**Total**
Male	32	18	50
Female	8	42	50
Total	40	60	100

Find these probabilities:

i). The respondent answered YES given that the respondent was a female (4 marks)

ii). The respondent waa a male, given that the respondent said NO. (4 marks)

b) Consider the following data

Class Interval	**Frequency**
90-99	5
100-109	8
110-119	22

120-129	27
130-139	17
140-149	9
150-159	5
160-169	5
170-179	2

Compute,

i. the absolute mean deviation (4 marks)

ii. quartile deviation (4 marks)

iii. the seventh decile (2 marks)

iv. the 85^{th} percentile (2 marks)

Question TWO (20 marks)

a). The owner of a video store is interested in how many videos a typical customer watches during ayear. She randomly selects the records of 90 customers and counts the number of videos rented during the previous year. The data are presented in the accompanying table.

67	63	64	57	56	55	53	53	54	54
45	45	46	47	37	23	34	44	27	44
35	37	24	24	14	43	37	27	36	26
25	36	26	5	44	13	33	33	17	33
56	17	26	5	14	23	45	59	19	49
37	42	32	29	90	44	46	45	66	28
28	75	32	31	52	49	65	54	15	23
59	61	40	41	43	49	38	31	19	24
45	41	38	14	57	25	20	15	16	12

Construct a grouped frequency distribution using 5 to 9 as the lowest class
(5 marks) and hence compute:

i) the 50thpercentile (2 marks)

ii) the mode (2 marks)

iii) the mean and the standard variation (5 marks)

b). A bag contains 4 black balls, 5 red balls and 4 green balls. If 4balls are selected at random what is the probability that the 4 selected contain

(i) No red ball?

(ii) Exactly 1 black ball?

(iii) Exactly 1 red ball and exactly 2 green balls? (6 marks)

Question THREE (20 Marks)

a). Discuss atleast four roles of statistics in decision making process. Use relevant examples (4 marks)

b). A random sample of 64 students were selected and given IQ tests. The following are the IQ scores:

111	85	83	98	107	101	100	94	101	86
105	122	104	106	90	123	102	107	93	109
141	86	91	88	98	128	93	114	87	116
99	94	94	106	136	102	75	96	78	116
107	106	68	104	91	87	105	97	110	91
107	107	85	117	93	108	91	110	105	99
85	99	99	96						

i). Present the above data in a stem-and-leaf plot (5 marks)

ii). From the plot, determine the most common IQ score range (2 marks)

iii). Determine the range for the IQ scores (1 mark)

c). A box contains 24 transistors, 4 of which are defective. If 4 are sold at random, find the following probabilities

i). Exactly 2 are defective. (2 marks)

ii). All are defective. (2 marks)

iii). None is defective. (2 marks)

iv). At least 1 is defective. (2 marks)