

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF MASTER  
OF SCIENC IN WILDLIFE AND ENTERPRISE MANAGEMENT & HOSPITALITY  
MANAGEMENT

MHIM 841/MATH 800: STATISTICS IN HOSPITALITY AND TOURISM BIOMETRY

STREAMS: MSC (WIEM, MHIM)

TIME: 3 HOURS

DAY/DATE: TUESDAY 06/04/2021

2.30 P.M. – 5.30 P.M.

INSTRUCTIONS:

- Answer question ONE and any other TWO
- Do not write anything on the question paper

1. In the following questions

(a) Discuss importance of central limit theorem in statistics [3 marks]

(b) Differentiate a probability distribution from a frequency distribution [4 marks]

(c) You are presented with a data of the height of 150 trees from woodlot A and a height of a similar number in woodlot B. you want to determine whether there is a

difference in mean height between the two woodlots

(i) Discuss factors you would consider before settling on the appropriate test statistic [10 marks]

(ii) With explanation, identify the best test for the hypothesis [3 marks]

2. (a) The weight of fish harvested from three ponds under different management systems is recorded below

Pond 1	8	6	7	5	7	5	8		
Pond 2	2	3	5	4	3	6	5	3	2
Pond 3	2	1	3	4	2	3	5	1	

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Using Kruskal-Wallis test, determine whether there are differences between the ponds [12 marks]

(b) Discuss the requirements for performing Kruskal Wallis test [8 marks]

3. (a) The monthly amount of rain recorded over eight months for two different regions (A and B) as shown below

A (mm)	15	20	18	8	10	5	12	16
B (mm)	18	22	20	6	8	6	16	16

By use of a t-test determine whether there is a significant difference between the amount received in the two regions [12 marks]

(b) The fish captured in a lake were categorized by their weight as shown below

Weight (kg) (x)	1-5	6-10	11-15	16-20	21-25
Number of fish (f)	25	40	45	35	10

**Calculate**

(i) The specific media weight [4 marks]

(ii) The standard deviation of the distribution [4 marks]

4. (a) The concentration of phosphates (mg/kg) in a stream is taken in two seasons, as shown below

Dry season	18	20	22	15	16	13	15	18	16	21
Wet season	10	8	11	9	7	10	12	11		

Using the man-Whitney U test, determine whether the concentration between the two areas was different [10 marks]

(b) In a certain research, community members in two villages neighboring a national park were asked to rate the benefits they got from the community social responsibility projects by park management. The responses are as given in the table below

	<b>Village</b>
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Rating	Lake view	Manyani
Very high	10	4
High	12	4
Moderate	15	13
Low	8	8
Very low	3	8

By use of a  $\chi^2$  test, test the association between the rating and project [10 marks]

**Note:**

$$H = \frac{12 SS_B}{N_T(N_T+1)}, SS_B = \frac{T_1^2}{N_1} + \frac{T_2^2}{N_2} + \dots + \frac{T_K^2}{N_K} - \frac{N_T(N_T+1)^2}{4}, Sp = \sqrt{\frac{S_1^2 + S_2^2}{2}}, \chi^2 = \sum \frac{(O-E)^2}{E}, U = N_1 N_2 + \frac{N_1(N_1+1)}{2} - R_1,$$

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