



KENYATTA UNIVERSITY

EXAMINATION FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN INFORMATION SCIENCE

ISC 905: STATISTICS

1ST SEMESTER 2022/2023

TIME: 3 Hours

INSTRUCTIONS:

Answer ALL question in SECTION 1

Answer ANY TWO questions in SECTION 2

SECTION 1: COMPULSORY

1. In a study on student revision behaviour in a university, the following data was captured;

Hours spent library (1, 3, 5, 6, 6, 7, 9, 17, 3, 20, 9, 20, 9, 10, 10,)

English performance % (10, 10, 33, 44, 30, 30, 60, 80, 50, 10, 20, 20, 16, 12, 50)

- (a) Determine the probability of picking a student who study between 3 to 5 hours. (10 (marks)

- (b) Showing your statistical approach, approve or disapprove the following hypothesis

Hypothesis 1: The probability of picking a student with performance of between 30% to 33% is 60%. (10 marks)

2. 300 males and 200 female university information users were asked how many advertisement in all media do they think they saw or heard during the day. The results were as shown below.

Gender	Number of advertisement				
	1-30	31-50	51-100	101-300	301 or more
Males	45	60	90	54	51
Females	50	50	54	30	26

at $\alpha = 0.01$, is the number of advertisement people feel that they see or hear related to the gender of the person. Show your workings. (20 marks)

SECTION 2: Answer TWO questions only

3. Explain the conclusion that can be drawn from the following correlation coefficients.

- (a) $r = 0.9$ (1 mark)
- (b) $r = -0.2$ (1 mark)
- (c) $r = 0.0004$ (1 mark)
- (d) Compute and interpret the correlation (r) of the two variables presented in the table below. (7 marks)

Variable x	Variable y
34	1895
40	3285
38	2920
41	3657
41	3260
36	2030
29	1440
40	3260
35	3090
40	3285
37	2690

4. A lecturer in information science obtained the following scores in indexing unit

Theory	95	90	85	80	75	70	65	60	55
Practical	76	78	77	71	75	79	73	72	74

- (i) prove mathematically whether the mean for practical can be legitimately used as the measure of central tendency. (2 marks)
 - (ii) The variance of each component of the indexing unit. (4 marks)
 - (iii) Standard deviation for each component. (2 marks)
 - (iv) Coefficient of variability for each component. (2 marks)
5. Using sketch diagrams, explain the mathematical characteristics of the following distributions.
- (i) Normal distribution (4 marks)
 - (ii) Negatively skewed distribution (3 marks)
 - (iii) Positively skewed distribution (3 marks)