CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATION

RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE (NURSING)

NURS 393: BIOSTATISTICS

STREAMS: BSc. Nursing   **TIME: 2 HOURS**

DAY/DATE: FRIDAY 07/05/2021   **11.30 A.M - 1.30 P.M.**

INSTRUCTIONS

- Answer all the questions in section I and **TWO** questions in section II
- Do not write anything on the question paper.

SECTION I: COMPULSORY (30 marks)

1. An epidemiologist determined the frequency of cancer among members of 600 families of size five. If the probability of cancer is 0.12 and this is a random event, predict the number of families,
    (a) With exactly one case of cancer?   (3 marks)
    (b) With one or more cases of cancer?   (3 marks)

2. Explain the following terms as used in epidemiological statistics.
    (a) Prevalence   (2 marks)
    (b) Incidence   (2 marks)
    (c) Mortality rate   (2 marks)

3. List the characteristics of a good questionnaire.   (4 marks)

4. (a) In an outbreak of tuberculosis among prison inmates in Kamiti maximum prison in 2012, 28 of 157 inmates residing on the East wing of the dormitory developed tuberculosis, compared with 4 of 137 inmates residing on the West wing.Calculate the risk ratio.

(4 marks)

(b) Using the following data calculate the vaccine effectiveness from the varicella.

(4 marks)

	Varicella	Non-case
Vaccinated	18	134
Unvaccinated	3	4

5. A hospital pharmacist routinely test the quality of drugs supplied by four companies (A, B, C and D). For testing purpose, he instructed his assistance to spread the order among the four companies A, B, C and D in the ratio of 5:4:2:1, respectively. As a spot check, 48 purchase orders were randomly selected from the last 6 months while the order was still in place and the company A, B, C and D had supplied 24, 11, 7 and 6 orders, respectively. Does this indicate that the instructions were followed? Test at 5% probability level.

(6 marks)

SECTION II (40 marks): ANSWER ANY TWO QUESTIONS

6. The following data set was obtained from a survey of a certain disease in a given locality. Using the data provide to calculate the mean, mode, median, standard deviation coefficient of variation (CV) and Pearson measure of skewness (PSK) of the number of person infected by the disease. Comments on PSK and CV obtained. (20 marks)

Age (years)	0-10	11-21	22-32	33-43	44-54	55-65
Number of person infected	6	22	44	58	46	32

7. The following data was obtained from an experiment conducted to investigate effects of anthropogenic increase in air pollution on incidence of four diseases in a certain locality.

Blocks/Diseases	Disease A	Disease B	Disease C	Disease D
Block 1	12	16	25	20
Block 2	13	17	26	19

Block 3	15	14	22	18
Block 4	22	15	19	19

Perform analyse of variance and test if the incidence offourdiseases are significantly different at 5% significance level. (20 marks)

8. (a) The following weight gains were obtained before and after taking a certain diet.

Person	1	2	3	4	5	6	7	8
Before	130	190	200	110	160	190	180	230
After	170	220	170	140	140	210	170	240

At a 5% level of significance, determine if there is significant change in weight gain before and after the diet implementation. (8 marks)

(b) Using the following data fit a regression model and obtain a correlation coefficient. (12 marks)

x	10	11	12	13	14	15	16
y	19	26	29	30	38	43	48

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