THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

P.O. Box 62157

00200 Nairobi - KENYA

REGINA PACIS INSTITUTE OF HEALTH SCIENCES

Telephone: 891601-6

MAIN EXAMINATION

SEPTEMBER – DECEMBER 2019 TRIMESTER

FACULTY OF SCIENCES

DEPARTMENT OF NURSING

REGULAR PROGRAMME

NUR / UNUR 307: MEDICAL BIOSTATISTICS I

Date: DECEMBER 2019	Duration: 3 Hours
INSTRUCTIONS: Answer ALL Questions	

PART- I: MULTIPLE CHOICE QUESTIONS (MCQs)   **(20 MARKS):**

Q1.   Calculate the median of these ten values.

         1.9, 1.9, 1.9, 1.9, 2.2, 2.3, 2.4, 2.4, 2.4, 2.4
            A. 1.9
            B. 2.1
            C. 2.25
            D. 2.4

Q2.   A number of cases of malaria are collected over 10 years with extreme variation in data. The best measure to calculate average is:
            A. Arithmetic mean
            B. Mode
            C. Geometric mean
            D. Median

Q3.   In a population study for malaria over the past few years, the number of case reported were 20, 5000, 100, 80, 60, 70, 40, 60, 80. The average is best represented by:
            A. Arithmetic mean
            B. Mode
            C. Geometric mean
            D. Median

ISO 9001:2015 Certified by the Kenya Bureau of Standards

Q4. Malaria incidence in a village in the year 2000 is 430, 500, 410, 160, 270, 210, 300, 350, 4000, 430, 480, 450. Which of the following is the best indicator for assessment of malaria incidence in that village by the epidemiologist?
        A. Arithmetic mean
        B. Geometric mean
        C. Median
        D. Mode

Q5. Ten babies are born in a hospital on same day. All weight 208 kg each. Calculate the standard deviation.
        A. Zero
        B. One
        C. Minus one
        D. 0.28

Q6. The mean Blood pressure samples from two community are best compared by:
        A. Paired t-test
        B. Student's t-test
        C. Chi-square test
        D. Cohort study

Q7. Calculate the mode of 70, 71, 72, 70, 70.
        A. 70
        B. 71
        C. 71.5
        D. 72

Q8. In an epidemiological study, the incubation periods obtained were 2, 5, 8, 10, 25, 10, and 30. The median is calculated to be:
        A. 50
        B. 22.5
        C. 10
        D. 5

Q9. *Correlation coefficient* provides all of the following information, *except* :
        A. whether or not there is a relationship between the variables.
        B. the strength of the relationship between the variables.
        C. the cause of the relationship between the variables.
        D. the direction of the relationship between the variables

Q10. A table that shows how often different scores appear in a set of scores is called a frequency:
        A. polygon
        B. histogram
        C. normal curve
        D. distribution

Q11. Analysis of Variance (ANOVA) test is used to
A. Test the difference between two independent group means
B. Test the difference between two related group means
C. Test the difference among the means of 3+ independent groups
D. Test the difference in ranks of scores of 3+ independent groups

Q12. Which is the most appropriate inferential analysis to test the difference among the means of 3+ related groups of sets of scores?
A. Repeated-measures ANOVA
B. Friedman test
C. Paired t-test
D. Wilcoxon signed-rank test

Q13. The type of research focused on finding a solution to an immediate practical problem is termed as:

A. Basic research
B. Applied research
C. Explanatory research
D. Descriptive research

Q14. The principles of ethics in nursing research include:
A. Beneficence
B. Respect for human dignity
C. Justice
D. All of the above

Q15. Which of the following is TRUE about features of quasi-experimental research design?
A. Manipulation. Control group, randomization
B. Manipulation, but no control group or randomization
C. No manipulation of independent variable
D. Use of correlational approach

Q16. In a community correlation between infant mortality and socioeconomic status is:
A. r = +1 (Strong positive correlation)
B. r = -1 (strong negative correlation)
C. r = -0.8 (moderate negative correlation)
D. r = +0.22 (strong positive correlation)

Q17. Given a set of numerical values with mean = 12, median = 17, and mode = 16, which of the following is true about the distribution?
A. Symmetrical
B. Positively skewed
C. Negatively skewed
D. Cannot be determined

Q18. In a population of 100 females in the age group of 15-45, the mean systolic BP was found to be 120. In a normal curve distribution, the number of people who would have an average BP above 120 will be:
A. 25
B. 50
C. 75
D. 95

Q19. In 11 babies born in a hospital, 5 are above 2.5 kg and 5 are below 2.5 kg. The value 2.5 is:
A. Median average
B. Mode average
C. Geometrical mean
D. Arithmetic average

Q20. Relationship between two variables can be presented by:
A. Pie diagram
B. Scatter diagram
C. Bar diagram
D. Histogram

PART- II: SHORT ANSWER QUESTIONS (SAQs)   (40 MARKS):

Q1. The following table lists length of stay in hospital (days) for a sample of 25 patients.
5, 10, 6, 11, 5, 14, 30, 11, 17, 3, 9, 3, 8, 8, 5, 5, 7, 4, 3, 7, 9, 11, 11, 9, 4, 4.

i) By hand, construct a frequency/relative frequency table for these data using 5-day class intervals. Include columns for the frequency counts, relative frequencies, and cumulative frequencies. **(4 marks)**
ii) What percentage of hospital stays were less than 5 days? **(2 marks)**
iii) What percentage of hospital stays were less than 15 days? **(2 marks)**
iv) What percentage of hospital stays were at least 15 days in length? **(2 marks)**

Q2. The following table lists some variables that might be of interest in your next data analysis. For each variable, complete the associated table indicating whether it is categorical (and if so, is it nominal or ordinal) or quantitative (and if so, is it discrete or continuous). **(10 marks)**

Variable	Categorical		Quantitative	
Eye Color	Nominal	Ordinal	Discrete	Continuous
a) How many hours you slept in the past 24 hours				
b) Whether or not you have slept for at least 7 hours in the past 24 hours				
c) Number of Harry Potter books that you have read				
d) How many states in the United States you have visited				
e) Handedness (which hand you write with)				
f) Political viewpoint (classified as liberal, moderate, or conservative)				
g) Day of the week on which you were born				
h) Average study time per week				
i) How many birthday cards you received on your last birthday				
j) Number of turkeys that visited your back yard during all of November last year.				

Q3. In the Nairobi Heart Study, Systolic Blood Pressure was tabulated for 100 Subjects including 37 Smokers and 63 Non-smokers, with the results given in the table below.

(8 marks)

Table1:

Class Interval	Relative Frequency (%)		Cumulative Relative Frequency (%)	
	Nonsmokers	Smokers	Nonsmokers	Smokers
90-109	16	14	16	14
110-129	38	41	54	55
130-149	29	27	83	82
150-169	14	8	97	90
170-189	3	5	100	95

190-209	0	5	100	100

a. What is the scale of measurement for systolic blood pressure? **(4 marks).**
b. Construct a figure that displays simultaneously the cumulative relative frequency distribution for nonsmokers and smokers and comment of the results. **(6 marks)**

Q4. Suppose that the distribution of weights of the CUEA Nursing students is distributed normal with mean 63.5 g and standard deviation 12.2 g.

a) If there are 100 weights in this population, how many of them are 78 g or greater? **(5 marks)**

b) Consider again the normal probability distribution of problem #4. What is the probability of selecting at random a sample of 10 students that has a mean greater than 65g? **(5 marks)**

PART III: LONG ANSWER QUESTIONS (LAQs) **(40 MARKS)**

Q1. Choking on food is an important cause of accidental deaths in infants. The following table is a summary of infant deaths from choking on food in Nairobi and Machakos, by year, for the years 1974-1985 as shown below;

Year	Number of Deaths
1974	126
1975	93
1976	97
1977	97
1978	90
1979	110
1980	74
1981	62
1982	41
1983	29
1984	30

Write a brief report (a paragraph or so, no more!) on these data that includes:

a) A summary of the facts given by the information in this table;

b) Some possible explanation for the decrease in deaths over time between 1979 and 1984.

Q2. Age is a variable that is important in most if not all epidemiological studies of health because our health is so strongly related to age. The following table is a two-dimensional table that summarizes the distribution of age in a certain population every five years starting with 1970 (the first row) to 2000 (the last row). Each row contains information for one year. Reading across the row (over the column), the table shows the number of individuals in each age group. If you choose this option, please do the following:

Year	Interval of Age, years				Total
	0-4	5-14	15-44	> 44	
1970	14	30	80	76	200
1975	27	50	120	103	300
1980	46	90	150	114	400
1985	60	110	165	115	450
1990	80	120	180	120	500
1995	100	135	190	125	550
2000	115	150	205	130	600

a) Using the data provided, produce a new two-dimensional table that shows, for each year, the percentage of that year's total population in each age interval.
(10 marks)

b) Write a brief report (a paragraph or so, no more!) on what these summaries suggest regarding the possibility (or lack thereof) of changes over time in the age distribution of this population.
(10 marks)

END