THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

P.O. Box 62157

00200 Nairobi - KENYA

Telephone: 891601-6

REGINA PACIS INSTITUTE OF HEALTH SCIENCES

MAIN EXAMINATION

JANUARY – APRIL 2019 TRIMESTER

FACULTY OF SCIENCES

DEPARTMENT OF NURSING

REGULAR PROGRAMME

NUR / UNUR 308: MEDICAL BIOSTATISTICS II

Date: APRIL 2019	Duration: 3 Hours
INSTRUCTIONS: Answer Question ONE and any other THREE Questions	

Q1.   **Either**
a) Discuss the processes for conducting a survey on health practices in a given county.   **[10 marks]**
Or

b) Discuss the processes involved in the development, testing and release of a medical drug.

Q2.   The Contingency Table below is from a study on the severity of a certain condition by blood types. Is there any reason to suggest that the condition and blood type are statistically associated α=0.05 level of significance?

Disease Condition	Blood Group			
	A	B	AB	O
ABSENT	100	120	80	170
MILD	20	23	10	30
SEVERE	10	7	10	30

$$\chi^2_{df=6,\alpha=0.05}=12.592$$

You may use: Use: **[20 marks]**

Q3. A hospital director requested for the study of length of stay in days of patients recovering from minor surgical procedure by THREE (3) recently engaged physicians. Eight records were obtained for each physician:

Surgeon A	5	3	3	4	3	3	4	5
Surgeon B	4	5	4	5	3	4	5	3
Surgeon C	4	5	5	4	6	6	4	5

a) What type of study was this? **[2 marks]**

b) What are the treatments in this study? **[1 mark]**

c) What were the experimental units or subjects? **[1 mark]**

d) Using Analysis of Variance (ANOVA), test the hypothesis of equality of stay duration among the three surgeons. [The critical value from F dist, 2-tailed: $F_{(df=2,21;\ \alpha=0.05]}$ =4.42] **[12 marks]**

e) What were the assumptions behind the use of ANOVA? **[4 marks]**

Q4. a) Distinguish between Pearson Product Moment Correlation and Spearman Rank Correlation Coefficients. **[5 marks]**

The Spearman Rank Correlation coefficient, r_s, may be given as

b)
$$r_{s.}=1-\frac{6\sum d_i^2}{n(n^2-1)}$$

i) What is the "**d**" in the formula? **[1 mark]**

ii) Given the paired data (age and EEG output)below, determine r_s **[10 marks]**

AGE	20	21	22	24	31	32	27	35	38	48	55	60
EEG	98	75	95	99	65	70	100	86	74	66	60	55

iii) Comment on the result and test its significance at the 5% level of significance.[You may use Critical value of -0.4965] **[4 marks]**

Q5. The following are the pulmonary blood flow (PBF) and pulmonary blood volume (PBV) values recorded for 16 infants and children with congenital heart disease:

PBV (Y)	605	522	224	291	429	233	370	531	516	211
PBF (X)	8.73	8.91	5.87	5.01	13.99	3.51	4.24	19.41	16.61	7.21

a) Produce a scatter diagram with PBV as the Y-axis being the response (dependent) variable and PBF on the X-axis as the independent or explanatory variable. **[3 marks]**

b) Compute the totals of Y and X, that is,
$$\sum_{i}^{16} Y_{i}.. \, and \sum_{i}^{16} X_{i}$$
[2 marks]

c) Compute the **uncorrected** sums of squares and products
$$\sum_{i-1}^{16} Y_{i}^{2}, \sum_{i=1}^{16} X_{i}^{2} \text{ and } \sum_{i=1}^{16} X_{i} Y_{i}$$
, **[3 marks]**

d) With the **corrected** Sums of Squares and Products, find the regression equation describing the linear relationship between the two variables, **and plot on the scatter diagram** produced in (a). **[10 marks]**

e) Compute the coefficient of determination and comment on it. **[2 marks]**

END