THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF BASIC SCIENCES
ACADEMIC YEAR 2020/2021 – SEMESTER 01
BACHELOR OF PHARMACY HONOURS
BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS

BSU4230 – BASIC STATISTICS – LEVEL 04
CONTINUOUS ASSESSMENT TEST II - NBT II
DURATION: ONE HOUR

DATE: 06ᵗʰ **January 2022**   TIME: **11.00 am – 12.00 noon**

REGISTRATION NO: ....

IMPORTANT INSTRUCTIONS / INFORMATION TO CANDIDATES

- This question paper consists of **10 pages** with **10 Multiple Choice Questions (Part A)** and **02 Structured Essay Questions (Part B).**

- **Part A / Section 1: Multiple Choice Questions - MCQs (20 marks):** There are 10 MCQs. Indicate answers for **all** questions in the answer sheet provided by placing a cross (x) in ink in the relevant cage (answers in pencil will not be marked).

- **Part B / Section 2: Structured Essay Questions–SEQs (80 marks):** There are 2 SEQs. Write answers for all within the space provided in the question paper.

- Answer **ALL** questions

- Write your **Registration Number** in the space provided.

- Do NOT bring in on person or have in possession unauthorized materials, including mobile phones and other electronic devices, or violate any other examination rules.

- Do NOT remove any page/part of this question paper from the examination hall.

- Non-programmable calculators are allowed.

- Please fill the address sheet. (See last page).

REGISTRATION NO: ....

ANSWER SHEET FOR PART A

Q. No.	(a)	(b)	(c)	(d)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Part A – Multiple Choice Questions

(2* 10 = 20 marks)

Choose the most suitable/ best answer and indicate with a 'X' in the answer sheet

1. Sampling units are not randomly selected in
   a) systematic sampling
   b) cluster sampling
   c) quota sampling
   d) stratified sampling

2. The group of elements/people from which a sample is actually selected, is called as
   a) study population
   b) reference population
   c) hypothetical population
   d) homogeneous population

3. Making inferences about the population based on sample data is called as
   a) descriptive statistic
   b) inferential statistic
   c) quantitative research
   d) qualitative research

4. Standard deviation of a sampling distribution is called
   a) variance
   b) coefficient of variation
   c) standard variation
   d) standard error

5. Most appropriate measure to describe the frequency of occurrence of an illness is the
   a) Prevalence
   b) Incidence rate
   c) Attack rate
   d) Mortality rate

6. The test used for estimating a survival curve which does not follow any probability distribution is called
   a) log rank test
   b) kaplan- meire test
   c) mann-whietny –U test
   d) correlation coefficient test

7. Cohort study is usually used to
    a) find the relationship between case and control
    b) identify causal factors for a disease by collecting data in the future
    c) investigate rare exposures
    d) collect data over time

8. Experimental unit(patient) receives different treatments during different time periods in
    a) single blind design
    b) double blind study
    c) cross over design
    d) nested design

9. Measures of validity includes
    a) Type I and Type II errors
    b) Precision and confidence intervals
    c) Repeatability and affordability
    d) Sensitivity and Specificity

10. Qualitative research methods include
    a) cohort study
    b) cross- sectional study
    c) case-control study
    d) focus group discussions

Part B –Structured Essay Questions
(80 marks)

Write answers in the space provided.

1.

a) A medical researcher wants to estimate the number of persons who are aged above 65 years infected with a certain disease in Sri Lanka. He is going to take a sample of 625 persons which randomly collects from each district, based on the population size of the district.

i. Define the terms **population, sample** and **sampling unit** in relation to this study. **(06 marks)**

Population-

Sample-

Sampling unit-

ii. State whether the population is finite or infinite. Give reason/s. **(03 marks)**

iii. What is the probability sampling method selected by the researcher? Give reason/s for your answer. **(04 marks)**

iv. If there were 210 infected persons in the sample, estimate the proportion of persons infected with that disease (give the answer in 3 decimals). **(02 marks)**

v. Estimate the standard error of the proportion you calculated (give the answer in 3 decimals).

(05 marks)

b) One hundred 100 persons were tested using a new screening test and a standard test. According to the results of the tests, the patients were labeled as either having disease (D+) or not having disease (D-). Results are given below.

		New Test		Total
		D +	D -	
Standard	D +	40	15	55
Test	D -	20	25	45
Total		60	40	100

i. Explain the terms Sensitivity and Specificity. **(05 marks)**

ii. Calculate sensitivity as a percentage. **(03 marks)**

iii. Calculate specificity as a percentage. **(03 marks)**

iv. Calculate PPV (Positive Predictive Value) as a percentage. **(03 marks)**

v. Calculate NPV (Negative Predictive Value) as a percentage. **(03 marks)**

vi. Calculate the prevalence of the disease as a percentage. **(03 marks)**

2.

a)

i. Explain the difference between qualitative and quantitative research methods?

(06 marks)

Qualitative research-

Quantitative research-

ii. Write down 03(three) quantitative research methods and 03(three) qualitative research methods.

(06 marks)

Qualitative research-

Quantitative research-

iii. What is the difference between retrospective studies and prospective studies? **(04 marks)**

Retrospective study-

Prospective study-

iv. Write down any 04(four) steps that are considered in a research process. **(04 marks)**

b) A researcher wants to investigate the risk of exposure to dust at work place based on cough problem experiences during the previous year. He selected a random sample of 500 persons from a population and asked whether they had cough problem (yes/ no) during the last year and their exposure to dust at work place (recorded as regularly exposed/ not regularly exposed).

i. State whether the researcher has conducted a case-control, cross-sectional or a cohort study? Give the reason for your choice. **(04 marks)**

ii. State whether the researcher has conducted a prospective study or a retrospective study? Give the reason for your choice. **(04 marks)**

iii. In this sample of 500 persons, 240 were reported as having regular exposure to dust at the workplace. Among them 60 had cough problem. 13 persons who had no regular exposure to dust also had cough problems. Summarize the data in a 2 x 2 contingency table. **(05 marks)**

		Having cough problem		Total
		Yes	No	
Exposure to dust	Regularly exposed			
	Not regularly exposed			

iv. Compute the relative risk (RR). **(04 marks)**

v. Interpret the computed relative risk (RR) value. **(03 marks)**

Reg. No:...

Name:..
Address:..
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