

MASTER OF SCIENCE (SPEECH-LANGUAGE PATHOLOGY)
M.Sc. (S.L.P.) Sem-I :SUMMER- 2022
SUBJECT : RESEARCH METHODS, STATISTICS & EPIDEMIOLOGY

Day : Monday

Time : 10:00 AM-01:00 PM

Date : 12/9/2022

S-19513-2022

Max. Marks : 80

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Draw neat diagrams **WHEREVER** necessary.
- 4) Answer to both the sections should be written in **SAME** answerbook.
- 5) Answers written in the inappropriate answerbooks will not be assessed in any case.

Section A: Part A :(Research methods & Epidemiology) (50 marks)

Q.1 Attempt any **two** out of **three** (2X15=30 marks)

- a. Researcher is interested to estimate risk of cancer of the pancreas associated with use of coffee, use suitable study design and help the researcher to test the hypothesis.
- b. Explain in brief case control study design
- c. Below are the data of 1000 newly diagnosed cases of Pancreas cancer. Calculate the incidence of deaths

| Year | No. of cases at start of period | No. of deaths | No. of withdrawals |
|------|---------------------------------|---------------|--------------------|
| 1 | 1000 | 200 | 55 |
| 2 | 731 | 117 | 63 |
| 3 | 553 | 53 | 47 |

Q.2 Attempt any **four** out of **five** (4X5=20 marks)

- a. Write down short notes on types of data
- b. Write down use of research in S.L.P.
- c. Write down disadvantages of cross sectional study
- d. Write down factors influencing the prevalence rate
- e. In the below table the grading of two pathologies are given calculate agreement between them

| | Grading by pathologist A | | |
|--------------------------|--------------------------|-----------|-------|
| | Grade II | Grade III | Total |
| Grading by pathologist B | | | |
| Grade I | 41 | 3 | 44 |
| Grade II | 4 | 27 | 31 |
| Total | 45 | 30 | 75 |

PTO

Section B: Part B:(Statistics)

(30 marks)

Q.3 Attempt any **two** out of **three**

(2X10=20 marks)

a. Shelby is sceptical of her friend's claim that Gerald's Café has much stronger coffee (in terms of caffeine content) than Sabine's Beans does. So Shelby takes a random sample of large coffees from both shops, and measures the amount of caffeine content in each coffee. Here is a summary of the results:

| | Sabine's Beans | Gerald's Cafe |
|------|----------------|---------------|
| Mean | 164 mg | 170 mg |
| SD | 5.1 mg | 3.1 mg |
| N | 37 | 35 |

Use appropriate test to claim above. (use level of significance as ten percent)

b. A certain medical experiment involves giving a group of randomly selected patients a drug to determine if that drug has a significant effect on a certain blood measurement. We'll choose a significance level of 0.01 for this case. The hypothetical data for two sets of measurements are given in the table below. The data is non normal. (Chi2 value for 1 df – 3.84, 2 df – 5.99)

| Number | 1 | 2 | 3 | 4 | 5 | 6 |
|-------------|------|------|------|------|------|------|
| Before drug | 1.02 | 1.05 | 1.09 | 0.98 | 0.97 | 1.01 |
| After drug | 1.04 | 1.04 | 1.10 | 0.97 | 1.01 | 1.07 |

c. The following table shows the persons suffering with respiratory illnesses in different groups. Based on these findings, can we claim that the proportion of respiratory illness is same in children and adult? Use a five percent level of significance.

| Respiratory illness | Children | Adult |
|---------------------|----------|-------|
| Present | 76 | 65 |
| Absent | 54 | 89 |

Q.4 Attempt any **two** out of **three**

(2X5=10 marks)

a. Explain stratified random sampling

b. Suppose researcher is interested to find out prevalence of anemia in the district A. The prevalence of anemia in neighboring district is 20%. Calculate optimum sample size for researcher. Take absolute allowable error as 5% and level of significance as 5%.

c. Calculate measure of central tendency for below data

12, 16, 20, 8, 25, 9, 31, 27, 38, 21, 16

T table values

| | | | |
|--------------------|-------|-------|-------|
| Alpha (One tailed) | 1% | 5% | 10% |
| DF – 70 | 2.764 | 1.812 | 1.372 |
| DF – 72 | 2.718 | 1.796 | 1.363 |
| Alpha (Two tailed) | 1% | 5% | 10% |
| DF – 70 | 3.169 | 1.983 | 1.678 |
| DF – 72 | 3.106 | 1.976 | 1.658 |
