MASTER OF SCIENCE (AUDIOLOGY)
M.Sc. (AUDIOLOGY) Sem-I :SUMMER- 2022
SUBJECT : RESEARCH METHODS, STATISTICS & EPIDEMIOLOGY

Day : Monday
Time : 10:00 AM-01:00 PM

Date : 12/9/2022
S-19533-2022
Max. Marks : 80

N.B.

1) All questions are **COMPULSORY**.
2) Figures to the **RIGHT** indicate **FULL** marks.
3) Draw diagrams **WHEREVER** necessary.
4) Answer to both the sections should be written in **SAME** answer book.

SECTION I
(RESEARCH METHODS AND EPIDEMIOLOGY)

Q.1 Attempt **ANY TWO** of the following :   **(30)**
   a) Researcher is interested to test the hypothesis that smoking causes lung cancer, use suitable study design and help the researcher to test the hypothesis.
   b) Explain in brief randomized control trial study design.
   c) Calculate correlation for age and glucose level and interpret result. (the data is normally distributed)

Subject	1	2	3	4	5	6
Age	43	21	25	42	57	59
Glucose level	99	65	79	75	87	81

Q.2 Attempt **ANY FOUR** of the following :   **(20)**
   a) Write down use of research in Audiology.
   b) Write down a short note on matching in a case-control study.
   c) Is the following statement acceptable? Why? (or why not) – Explain.
      "The annual incidence rate of the disease was 1200 per 1000 persons at risk"
   d) Calculate relative risk for given data and interpret the result.

	Cancer		Total
	Yes	No	
In exposed	40	90	130
In non-exposed	10	60	70
Total	**50**	**150**	**200**

   e) Write down advantages of cross sectional study.

SECTION II
(STATISTICS)

Q.3 Attempt **ANY TWO** of the following :   **(20)**
   a) Below is the data level of cholesterol level before and after an examination. Use the appropriate test to claim the change before and after examination level of cholesterol is decreased at 5% level of significance.

Student	1	2	3	4	5	6	7	8	9	10	11
Before	160	170	184	179	140	151	129	155	161	160	180
After	154	155	179	195	141	144	137	170	149	170	168

b) In an opinion poll, the respondents are asked to vote either in favour or against a proposition. The following data are obtained on the basis of a random sample of 200 voters. It is intended to examine possible association between age and voting pattern. Use appropriate test to find out association between age and voting pattern. It is given that the tabled value of the Chi-square distribution with right tail area equal to 5% for 1,2 and 3 degrees of freedom are 3.84, 5.99 and 7.81 respectively.

	In favour	Against	Total
Young	80	20	100
Middle-aged	40	30	70
Old	20	10	30
Total	**140**	**60**	**200**

c) The growth of children can be important indicator of general level of nutrition in developing countries. Data from several studies suggest that height (in centimeters) of five year old children is distributed normally with mean 100 cm and standard deviation 6 cm.
   i) What proportion of five year old children have height between 94 and 112 cms.?
   ii) What is the chance that a child will be taled than 110 cms.?

	P (Z<-1)	P (Z<-2)	P (Z<2)	P (Z<1.67)	P (Z<-1.67)
Probability	0.1587	0.0228	0.9772	0.9515	0.0475

Q.4 Attempt **ANY TWO** of the following : **(10)**

a) The following table shows the persons suffering with respiratory illnesses in different groups. Calculate expected value for every cell.

Respiratory illness	Children	Adult
Present	76	65
Absent	54	89

b) Systolic blood pressure of 100 males was taken. Mean BP was found to be 128 mm and S.D. 13.05 mm. find 95% confidence limits of BP within which the population mean would lie.

c) In the below table grading of two pathologies are given, calculate agreement between them

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

Alpha (One tailed)	1%	5%	10%
DF–10	2.764	1.812	1.372
DF–11	2.718	1.796	1.363
DF–21	2.878	1.913	1.421
DF–22	2.898	1.889	1.402
Alpha (Two tailed)	1%	5%	10%
DF–10	3.169	2.228	1.812
DF–11	3.106	2.201	1.796
DF–21	3.576	2.356	1.856
DF–22	3.589	2.425	1.889

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