

2072
M.E. (Computer Science and Engineering)
Second Semester
CS-8202: Research Methodology

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

Q1.

- (a) How to select a research problem?
- (b) A random sample of 50 employees of an IT company it is found that the mean age and sample standard deviation is to be 27 years and 4.5 years respectively. Construct a 95% confidence interval for the mean age of IT company employees. (z for 95% confidence interval is 1.96).
- (c) Consider the two objects O1 and O2 with two attributes x_1 and x_2 . Find the Euclid and Manhattan average distance.

Objects	Variable	
	x_1	x_2
O1	5	6
O2	2	3

- (d) Define Type I and Type II error.
- (e) What is self-plagiarism?

(5x2)

Section-A

Q2.

- (a) Define Research Design. What are the features of a good research design? (5)
- (b) Consider the sample dataset in table below. What is its regression analysis? (5)

Size(x)	Numbers of pixels(y)
1	1
2	4
3	9
4	16
5	25

Q3.

- (a) What is Hypothesis? Discuss hypothesis testing. (5)
- (b) What should be the size of sample if a random sample from a population of 4000 PCs is to be drawn to estimate the percent of defective within 2 percent of the true value with 95.5 per cent probability? What would be size of sample if the population is assumed to be infinite? (Given $z=2.005$ for 95.5% confidence level). (5)

(2)

Q4.

- (a) Consider the two variables breadth and length of objects in pixels, as given below. What is correlation between the variable breadth and length? (3)

Breadth	Length
10	30
15	45
20	60
25	65
30	80

- (b) The table given below provides the data collected during the outbreak of Covid-19:

	Affected	Not Affected	Total
Vaccinated	31	469	500
Not Vaccinated	185	1315	1500
Total	216	1784	2000

Test the effectiveness of vaccination in preventing Covid-19 using Chi-square test at 5% level of confidence. (Table value of χ^2 for 1 degree of freedom at 5% level of significance is 3.841). (5)

- (c) Compare Parametric and non-parametric tests. (2)

Section-B

Q5.

- (a) Explain, the different ethical issues related to publishing. (4)
- (b) Citing the references in the research report is very important. How should it be done? (3)
- (c) Give the uses of Research Gate. (3)

Q6. Write short notes on following:

- (a) Minitab (5)
- (b) Documentation in the context of a research report (5)

Q7.

- (a) Explain the significance of report writing. Describe, in brief, the layout of research report covering all important aspects. (7)
- (b) Write a short note on SPSS. (3)