PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END EXAMINATION – AUGUST- 2024

Semester :II	**Date :22 August 2024**
Course Code :RES5001	**Time :9:30am to 12:30pm**
Course Name :Research Methodology	**Max Marks :100**
Program :M.Tech BCT	**Weightage :50%**

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A			
ANSWER ANY 5 QUESTIONS		**5Q X 4M=20M**	
1	Explain the concept of data falsification in research.	(CO 1)	[Knowledge]
2	Discuss the importance of publication ethics in maintaining the trustworthiness of scientific literature, and outline the responsibilities of authors, reviewers, and editors in upholding these ethics.	(CO 1)	[Knowledge]

3	List the different types of research, clearly pointing out the difference between following:
	    i) Conceptual Research and Empirical Research.
	    ii) Experimental Research and Historical Research
		(CO 1)	[Knowledge]

4	What is a Type I and Type II error in hypothesis testing?	(CO 1)	[Knowledge]
5	Explain the concept of data falsification in research. What is the significance of a Digital Object Identifier (DOI) in research publications?	(CO 1)	[Knowledge]
6	A researcher believes that the average height of a certain species of plant is 15 cm. A sample of 10 plants has a mean height of 14.5 cm with a standard deviation of 1 cm. Set up the null hypothesis for this study.	(CO 1)	[Knowledge]
7	Examine the consequences of scientific misconduct, such as falsification and fabrication, on the credibility of research findings and the broader scientific community.	(CO 1)	[Knowledge]

PART B		
ANSWER ANY 4 QUESTIONS		**4Q X 10M=40M**

| 8 | The following data represents the number of hours 10 different students watched television during the weekend and the scores of each student who took a test the following Monday.
    a.) Display the scatter plot.
    b.) Calculate the correlation coefficient r.
    (C.O.No.4) | (CO 3) | [Application]] |

Hours, x	0	1	2	3	3	5	5	5	6	7
Test score, y	92	81	79	70	71	66	74	76	56	63

9	Given a dataset, perform a hypothesis test to determine if the mean of a sample is significantly different from a known population mean. Include all steps and calculations.	(CO 2)	[Comprehension]
10	A researcher conducts a hypothesis test with a sample mean of 52, a population mean of 50, a standard deviation of 5, and a sample size of 30. Calculate the test statistic and determine whether to reject the null hypothesis at a 0.05 significance level.	(CO 2)	[Comprehension]
11	Central tendency is a statistical measure that determines a single value that accurately describes the center of the distribution and represents the entire distribution of scores, explain all the relevant parameters of central tendency used in the research.	(CO 3)	[Application]]
12	What is peer-reviewed publication? Explain the purpose of a research abstract.	(CO 2)	[Comprehension]
13	Analyse the importance of selecting the right journal for publication, considering factors such as target audience, scope, impact factor, and editorial policies.	(CO2)	[Comprehension]

	PART C		
	ANSWER ANY 2 QUESTIONS		**2Q X 20M=40M**
14	A CompTech, Laptop Retail shop near Eco-world at Belandur, Bengaluru has been having average sales of 125 Laptops per day. Because of the development of IT Park nearby, it expects to increase its sales. During the first 10 days after the start of the IT Park, the daily sales were as 145, 140, 110, 125, 135, 145, 160, 155, 100, 150, 130, and 126. On the basis of this sample information, can one conclude that CompTech sales have increased? Use 5% level of significance.	(CO 3)	[Application]
15	The researcher must at the same time examine all available literature to get himself acquainted with the selected problem. He may review two types of literature the conceptual literature concerning the concepts and theories, and the empirical literature consisting of studies made earlier which are similar to the one proposed. The basic outcome of this review will be the knowledge as to what data and other materials are available for operational purposes which will enable the researcher to specify his own research problem in a meaningful context. After this the researcher rephrases the problem into analytical or operational terms i.e., to put the problem in as specific terms as possible. This task of formulating, or defining, a research problem is a step of greatest importance in the entire research process. How you arrive at defining your research problem based on the review of literature. Explain in detail how you have done it or going to do this process in your ensuing research. Your answer will be assessed based on the assignments 1 and 2 and standard procedure of review of literature followed by the research community at large.	(CO 3)	[Application]
16	In a random selection of 60 of the 2000 intersections in a small city, the mean number of scooter accidents per year was 3.0 and the sample standard deviation was 0.7. (i) Make an estimate of the standard deviation of the population from the sample standard deviation. (ii) Work out the standard error of mean for this finite population. (iii) If the desired confidence level is 0.90, what will be the upper and lower limits of the confidence interval for the mean number of accidents per intersection per year?	(CO 1)	[Application]