

[This question paper contains 2 printed pages]

Unique Paper Code : 2513010016

Name of the Course : B.Sc.(H) Electronics (DSE)

Name of the Paper : Research Methodology

Semester : VII

Duration : 03 Hours

Maximum Marks : 90

Instruction for Candidates

1. Write your Roll no. on the top immediately on receipt of this question paper.
2. Question 1 is compulsory. All questions carry equal marks.
3. Question paper has 7 questions out of which 5 questions will have to be attempted.

1. (a) What is the need for a Research design? 3
- (b) Name important heads which must be included in the content of a Thesis/Dissertation. 3
- (c) Define Interpolation and extrapolation. 3
- (d) What do you understand by an open-access journal? 3
- (e) Define trademarks. 3
- (f) Mention any two softwares to check plagiarism. 3
2. (a) What do you mean by Research? Describe the different types of research, clearly pointing out the difference between an experiment and a survey. 6
- (b) Why probability sampling is generally preferred in comparison to non-probability sampling? Explain the procedure of selecting a simple random sample. 6
- (c) Explain how quantitative approach is different from qualitative approach in research process. 6
3. (a) What do you mean by Experimental design? Name all categories. 6
- (b) Explain the meaning of the following in context of Research design. 6
 - (i) Extraneous variables
 - (ii) Confounded relationship
 - (iii) Experimental and Control groups
- (c) Write the sources of Research problems and the considerations in selecting 6

them.

4.
 - (a) What are Research objectives? What considerations should one bear in mind in wording them? 6
 - (b) What do you mean by Validity in research? Write different types of validity in research design. 6
 - (c) What is hypothesis? What characteristics it must possess in order to be good research hypothesis? 6

5.
 - (a) Describe the key steps involved in conducting a comprehensive literature survey. Why is each step important for ensuring the quality and credibility of research? 6
 - (b) What are Citations and why do researchers cite them? Name any two styles of citations. 6
 - (c) What is h-index? How is it calculated? Explain by giving an example. 6

6.
 - (a) Explain the concept of Impact Factor and compare it with at least two other journal metrics (such as CiteScore, SJR, or SNIP). How do these metrics differ in purpose and what are their advantages and limitations in evaluating research quality? 6
 - (b) Discuss the importance of reference management software (such as Zotero, Mendeley) in academic research. How do these tools assist researchers in organizing citations, preventing plagiarism, and improving workflow efficiency? 6
 - (c) Explain the importance of Intellectual Property Rights in today's knowledge-based economy. Discuss how IPR encourages innovation and protects creators, giving suitable examples. 6

7.
 - (a) Differentiate between Primary data and Secondary data. Explain any two advantages and two limitations of each type, and describe situations where each type of data is most appropriately used. 6
 - (b) Explain the concept of Plagiarism in academic research. What are the different types of plagiarism, and why is it considered a serious ethical violation? 6
 - (c) What is curve fitting in data analysis? Explain the difference between linear and non-linear curve fitting and describe any two methods used for fitting a curve to a set of data points, with suitable examples. 6