

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 287

L

Unique Paper Code : 2513010016

Name of the Paper : Research Methodology

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

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. There are **seven** questions in all, out of which you have to attempt **five** questions.
3. **All** questions carry equal marks.
4. **First** Question is Compulsory.

1.
 - (a) What are the motivations for doing research in electronics? 3
 - (b) What is the significance of replication in an experimental design? 3
 - (c) Name important heads which must be included in the content of a thesis/dissertation. 3
 - (d) Name any three academic search engines and databases. 3
 - (e) What is a patent? Why are they important? 3
 - (f) What is simulation? How can simulation help in research? 3
2.
 - (a) What are the methods used to collect and analyze the qualitative and quantitative data in research? Explain them by giving examples. 6
 - (b) What are the research goals, focus areas and techniques used in diagnostic research? 6
 - (c) Elaborate briefly various steps in research process emphasizing their importance. 6
3.
 - (a) Define hypothesis testing. Explain research and null hypothesis by taking an example. 6
 - (b) What is a sample design? Explain simple random, systematic and stratified sampling techniques. 6
 - (c) Compare informal and formal experimental designs? Explain by giving examples. 6
4.
 - (a) What are primary, secondary and tertiary sources of literature review? Give at least two examples of each. 6

P.T.O.

- (b) Why is validity important in research? What are the different types of validity in a research design? Explain extrapolation and interpolation in this context. 6
 - (c) What is the importance of error metrics in statistical analysis? Explain any two error metrics. 6
- 5.
 - (a) Define journal metrics? Explain the usefulness of journal impact factor, citescore and source normalized impact per paper. 6
 - (b) Define h-index. What is the importance of h-index? If an author has five publications, with 9, 7, 6, 2, and 1 citation respectively, what will be the h-index? 6
 - (c) What is trademark? How are they secured? What do the symbols TM and ® indicate. 6
- 6.
 - (a) What is citation count? What does it measure? Where is it displayed? Why citation counts for the same paper differ across different databases? 6
 - (b) What are the common types of IPR? How can they be secured? Name the website for IPR in India? 6
 - (c) Differentiate between plagiarism and self-plagiarism with examples. 6
- 7.
 - (a) What are open access publications? Explain the benefits of open access resources? Give two examples of open access resources in electronics. 6
 - (b) 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
 - (c) How can reference management software/tools like Zotero/Mendeley help researchers? Explain in detail. 6