PHY-501: RESEARCH METHODOLOGY

Credits: 4   **Max. Marks: 70**
Periods per week: 4 Hrs.   **Duration of Exam.: 3 Hrs.**

Note: There are **nine** questions in all. Question No. 1 is compulsory consisting of 5 short questions of 2 marks each. Students have to attempt **five** questions in all including compulsory question, selecting one question from each unit.

Unit-I
Introduction: Concept of research; characteristics features of research, Types of research, objectives of research, Review of Literature. Scope of research, validity and reliability of research, Process of research: steps involved in research process, Selecting a research topic, Planning and designing research, Criteria of good research, Rules and principles of scientific methods, Hypothesis, Data collection, Analysis and interpretation of data, Experimental techniques.

Unit II:
Errors & Curve Fitting: Errors- Round off error, Truncation error, Machine error, Random error, Propagation of errors. Loss of Significance: Significant digits, Computer caused loss of significance, Avoiding loss of significance in subtraction, Least square curve fitting: The principle of least square fitting, Linear regression, Polynomial regression, Fitting exponential and trigonometric functions.

Unit III
Hypothesis: Meaning of hypothesis, Importance of hypothesis, Types of hypothesis, Source of hypothesis, Characteristics of hypothesis, Use of hypothesis in research, Different form of hypothesis, Difficulties in the formation of hypothesis, Testing of hypothesis, Test of significance, Steps in testing, Student's t- distribution, F-test, Chi-Square (χ^2) test.

Unit-IV
Preparation of Dissertation: writing a scientific paper, Journal impact factor, citation index, seminar, conference and workshops, Types and layout of research, Precautions in preparing the research dissertation, Bibliography and annexure, Discussion of results, Draw conclusions, Giving suggestions and recommendations to the concerned persons.

Text and Reference Books:

1. K. Prathapan   : Research Methodology for Scientific Research (IK International)
2. C.R. Kothari   : Research Methods, Methods & Techniques (Second Revised Edition)
3. P.B. Patil and U.P. Verma : Numerical Computational Methods (Narosa Pub. House)
4. S.S. Sastry   : Introductory Methods of Numerical Analysis (PHI)
5. Santosh Gupta   : Research Methodology and Statistical Techniques (Deep Publication)

PHY-701: RESEARCH METHODOLOGY

Credits: 4
Periods per week: 4 Hrs.

Max. Marks: 70
Duration of Exam.: 3 Hrs.

Note: There are **nine** questions in all. Question No. 1 is compulsory consisting of 5 short questions of 2 marks each. Students have to attempt **five** questions in all including compulsory question, selecting one question from each unit.

Unit-I
Introduction: Concept of research; characteristics features of research, Types of research, objectives of research, Review of Literature. Scope of research, validity and reliability of research, Process of research: steps involved in research process, Selecting a research topic, Planning and designing research, Criteria of good research, Rules and principles of scientific methods, Hypothesis, Data collection, Analysis and interpretation of data, Experimental techniques.

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