



Paper -I

Research Methodology

LEARNING OUTCOMES:

- Understand the concept of various technical terminology used in Research methodology
- Develop an understanding of the various methods used in research.
- Gaining knowledge about conducting research and their implementation.

Subject Code	Subject Title	Credits	Examination Scheme			Total Marks
			Hrs.	Max Marks		
				MCQs	Descriptive	
	Research Methodology	4	3	50	50	100

CONTENT:

UNIT	
1	<p style="text-align: right;">(Weightage 25%)</p> <ul style="list-style-type: none"> • Introduction to Research Methodology Definition – History – Evolution of Scientific Inquiry, Scientific Research: Definition, Characteristics, types, need of research. Identification of the problem, assessing the status of the problem, formulating the objectives, preparing design (experimental or otherwise), Actual investigation. Meaning of Research, Objectives of Research, Motivations in Research, Types of Research, Research Approaches, Significance of Research, Research Methods v/s Methodology, Research and Scientific Methods, Research Process, Criteria of Good Research Need for Research Design, Features of Good Design, Concepts, Types. Basic Principles of Experimental Design, Developing a Research Plan
2	<p style="text-align: right;">(Weightage 25%)</p> <ul style="list-style-type: none"> • Sampling, Measurements & Data Collection Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design, Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs, How to Select a Random Sample? Random Sample from an Infinite Universe, Complex Random Sampling Designs, Need for Sampling, Some Fundamental Definitions, Important Sampling Distributions, Central Limit Theorem, Sampling Theory, Sandler's A-test, Concept of Standard Error, Estimation, Estimating the Population Mean (μ), Estimating Population Proportion, Sample Size and



	<p>its Determination</p> <p>Measurement in Research, Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling, Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques.</p> <p>Collection of Primary Data, Observation Method, Interview Method, Collection of Data through Questionnaires, Collection of Data through Schedules, Difference between Questionnaires and Schedules, Some Other Methods of Data Collection, Collection of Secondary Data, Selection of Appropriate Method for Data Collection, Case Study Method</p>
3	<p style="text-align: right;">(Weightage 25%)</p> <ul style="list-style-type: none"> • Analysis & Testing <p>Processing Operations, Some Problems in Processing, Elements/Types of Analysis, Statistics in Research, Measures of Central Tendency, Measures of Dispersion, Measures of Asymmetry (Skewness), Measures of Relationship, Simple Regression Analysis, Multiple Correlation and Regression, Partial Correlation, Association in Case of Attributes</p> <p>What is a Hypothesis? Basic Concepts Concerning Testing of Hypotheses, Procedure for Hypothesis Testing, Flow Diagram for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Tests of Hypotheses, Important Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing and Limitations of the Tests of Hypotheses</p> <p>Chi-square, Analysis of Variance (ANOVA), Testing of Hypotheses (Nonparametric or Distribution-free Tests), Sum Tests, Multivariate Analysis Techniques</p>
4	<p style="text-align: right;">(Weightage 25%)</p> <ul style="list-style-type: none"> • Scientific/ Report writing, Computer and Ethics <p>Structure and Components of Scientific Reports, Types of Report, Technical Reports and Thesis, Significance, Different steps in the preparation, Layout, Structure and Language of Typical Reports, Illustrations/ Interpretation and Tables, Bibliography, Referencing and Foot Notes. Preparation of the Project Proposal, Title, Abstract, Introduction, Rationale, Objectives, Methodology, Time frame and Work Plan, Budget and Justification, References. Paper publications, presentation, conference, workshop, seminar, symposium, journals, impact factor of journals</p> <p>Use of tools / techniques for Research: methods to search required information effectively, Reference Management Software like Zotero/Mendeley, Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism like turnitin, grammarly</p> <p>Ethical issues related to publishing, Plagiarism and Self-Plagiarism, Ethical Committees, Commercialization, Intellectual Property rights (Patent, Copy right, Trade mark, Design), Royalty, Reproduction of published material, Citation (h and i10 index) and Acknowledgement, Reproducibility and accountability.</p>

REFERENCES BOOKS

1. Garg.B.L., Karadia, R., Agarwal,F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R.(2008). Research Methodology: Methods and Techniques. Second Edition. New Age International Publishers, New Delhi.



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3. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, EssEss Publications. 2 volumes.
4. Gupta S.P. (2008). Statistical Methods. 37 th ed. (Rev)Sultan Chand and Sons. New Delhi. 1470 p.
5. Leon & Leon (2202). Internet for everyone, Vikas Publishing House.
6. Wadehra, B.L.2000. Law relating to patents, trade marks, copyright designs and geographical indications. Universal Law Publishing.
7. Research Methodology Dr P M Bulakh,Dr P. S. Patki and Dr A S Chodhary 2010
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