Vishwakarma Institute of Information Technology, Pune-48

(An Autonomous Institute Affiliated to Savitribai Phule Pune University)

Ph. D Entrance Test

Paper 1A: Research Methodology

Examination Scheme
Total Marks: 50
(Multiple Choice Questions- 2 marks each)

Unit I: Introduction to Research and Research Design
Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research Process, Criteria of Good Research   Meaning of Research Design, Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs
Unit 2: Sampling Design
Sampling Design, 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
Unit 3: Measurement and scaling Techniques   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
Unit 4: Methods of data collection   Methods of Data Collection, 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
Unit 5: Processing and Analysis of Data   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.
Unit 6: Ethics in Research and Report Writing   Plagiarism - Definition, different forms, consequences, unintentional plagiarism, copyright infringement, collaborative work, Qualities of good Researcher.   Research Report, Writing a Research Report, Research Paper writing, Layout of research paper, Paper publishing, Impact factor, Citation & Acknowledgements
List of Books:

1. Donald Cooper and PS Schindler (2009) Business Research Methods, 9th edition, Tata McGraw Hill.
2. Uma Sekaran (2010) Research Methods for Business, 4th edition, Wiley.
3. Ranjit Kumar (2009), Research Methodology, 2nd edition, Pearson Education
4. Naresh Malhotra and S Dash (2009) Marketing Research, 5th edition, Pearson Prentice Hall

Paper 1B: Mathematics for Engineers

Examination Scheme
Total Marks: 30
(Multiple Choice Questions- 2 marks each)

Unit 1: Probability and Statistics
Definitions of probability, Conditional probability, Mean, median, mode and standard deviation, Random variables, Poisson, Normal and Binomial distributions.
Unit 2: Numerical Methods
Numerical solutions of linear and non-linear algebraic equations, Numerical solutions of differential equations by Euler's, and Runge Kutta fourth order method, Integration by trapezoidal and Simpson's rule.
Unit 3: Matrices
Definition of a matrix, types of matrices, Algebra of matrices, Inverse of a matrix by Adjoint method and by Elementary transformation, Rank of a matrix, Solution of system of Linear homogeneous and non-homogeneous equations, Eigen values, Eigen vectors, Cayley Hamilton theorem
List of Books:
1. Advanced Engineering Mathematics by Erwin Kreyszig (Wiley India).
2. Statistical Methods by S. P. Gupta, (S. Chand Publication, Delhi).
3. Higher Engineering Mathematics by B. S. Grewal (Khanna Publication, Delhi).

Paper 1C: Computer Fundamentals

Examination Scheme
Total Marks: 20
(Multiple Choice Questions- 2 marks each)

Unit 1:
Introduction to Computer System, Basic Building blocks of Computer, Use and applications of Computer. Definitions of- Hardware, Software, Algorithm, flowchart, Program, Programming language, System software, Application software, Operating system, Complier and Interpreter, Basic of Internet, WWW, Browser & Search Engines.

Dean R&D
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