

Centenary Celebrated Sharnbasveshwar Vidya Vardhak Sangha's



Poojya Doodappa Appa
7th Mahadesha Pethadhipati,
Sharnbasveshwar Samasthan
Founder President, Sharnbasveshwar
Vidya Vardhak Sangha



Poojya Chiranjeevi Doodappa Appa
5th Bhatti Mahadesha Pethadhipati,
Sharnbasveshwar Samasthan

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Estd.: 2017
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President, Sharnbasveshwar Vidya Vardhak Sangha
Chancellor, Sharnbasva University, Kalaburagi

Approved By:
*Govt of Karnataka vide Notification No, ED 144 URC 2016 Dt 29/07/2017
*UGC Under Section 2f Vide letter No. F.8-29/2017 (CPP-I/PU), Dt 20/12/2017

Approved By:
*All India Council for Technical Education (AICTE), New Delhi
*Council Of Architecture (COA), New Delhi

SYLLABUS FOR PH.D. ENTRANCE EXAMINATION 2020-21

Faculty of Computer Applications

Part – I: Research Methodology (Weightage 50%)

Module 1:

Research Methodology: Research Methodology: Introduction, Meaning of Research, Objectives of Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Research Process, Criteria of Good Research, Problems Encountered by Researchers in India.

Defining the Research Problem: Research Problem, Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem, An Illustration.

Module 2:

Reviewing the literature: Place of the literature review in research, Bringing clarity and focus to research problem, Improving research methodology, Broadening knowledge base in research area, Enabling contextual findings, Review of the literature, searching the existing literature, reviewing the selected literature, Developing a theoretical framework, Developing a conceptual framework, Writing about the literature reviewed.

Research Design: 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, Important Experimental Designs

Module 3:

Design of Sample Surveys: Design of Sampling: Introduction, Sample Design, Sampling and Non-sampling Errors, Sample Survey versus Census Survey, Types of Sampling Designs.

Measurement and Scaling: Qualitative and Quantitative Data, Classifications of Measurement Scales, Goodness of Measurement Scales, Sources of Error in Measurement, Techniques of Developing Measurement Tools, Scaling, Scale Classification Bases, Scaling Technics, Multidimensional Scaling, Deciding the Scale.

Data Collection: Introduction, Experimental and Surveys, Collection of Primary Data, Collection of Secondary Data, Selection of Appropriate Method for Data Collection, Case Study Method.

Module 4:

Testing of Hypotheses: Hypothesis, Basic Concepts Concerning Testing of Hypotheses, Testing of Hypothesis, Test Statistics and Critical Region, Critical Value and Decision Rule, Procedure for Hypothesis Testing, Hypothesis Testing for Mean, Proportion, Variance, for Difference of Two Mean, for Difference of Two Proportions, for Difference of Two Variances, P-Value approach, Power of Test, Limitations of the Tests of Hypothesis.

Chi-square Test: Test of Difference of more than Two Proportions, Test of Independence of Attributes, Test of Goodness of Fit, Cautions in Using Chi Square Tests

Module 5:

Interpretation and Report Writing: Meaning of Interpretation, Technique of Interpretation, Precaution in Interpretation, Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Mechanics of Writing a Research Report, Precautions for Writing Research Reports.

Intellectual Property: The Concept, Intellectual Property System in India, Development of TRIPS Complied Regime in India, Patents Act, 1970, Trade Mark Act, 1999, The Designs Act, 2000, The Geographical Indications of Goods (Registration and Protection) Act 1999, Copyright Act, 1957, The Protection of Plant Varieties and Farmers' Rights Act, 2001, The Semi-Conductor Integrated Circuits Layout Design Act, 2000, Trade Secrets, Utility Models, IPR and Biodiversity, The Convention on Biological Diversity (CBD) 1992, Competing Rationales for Protection of IPRs, Leading International Instruments Concerning IPR, World Intellectual Property Organisation (WIPO), WIPO and WTO, Paris Convention for the Protection of Industrial Property, National Treatment, Right of Priority, Common Rules, Patents, Marks, Industrial Designs, Trade Names, Indications of Source, Unfair Competition, Patent Cooperation Treaty (PCT), Advantages of PCT Filing, Berne Convention for the Protection of Literary and Artistic Works, Basic Principles, Duration of Protection, Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement, Covered under TRIPS Agreement, Features of the Agreement, Protection of Intellectual Property under TRIPS, Copyright and Related Rights, Trademarks, Geographical indications, Industrial Designs, Patents, Patentable Subject Matter, Rights Conferred, Exceptions, Term of protection, Conditions on Patent Applicants, Process Patents, Other Use without Authorization of the Right Holder, Layout-Designs of Integrated Circuits, Protection of Undisclosed Information, Enforcement of Intellectual Property Rights, UNSECO.

References:**Text Books:**

- C.R. Kothari, Gaurav Garg, “Research Methodology: Methods and Techniques”, New Age International, 4th Edition, 2018.
- Ranjit Kumar, “Research Methodology a step-by-step guide for beginners. (For the topic Reviewing the literature under module 2)” , SAGE Publications Ltd, 3rd Edition, 2011.
- Study Material (For the topic Intellectual Property under module 5), Professional Programme Intellectual Property Rights, Law and Practice, The Institute of Company Secretaries of India, Statutory Body Under an Act of Parliament, September 2013.

Reference Books:

- Trochim, “Research Methods: the concise knowledge base” , Atomic Dog Publishing, 2005.
- Fink A, “Conducting Research Literature Reviews: From the Internet to Paper”, Sage Publications, 2009.

PART -II: Computer Applications (Weightage 50%)

Unit 1

Data Structures and its applications:

Introductions, primitive, arrays, strings, stacks recursion, queues, linked lists, trees, sorting and searching

Reference:

- 1.Erns Horowitz and Sartaj Sahni, Fundamentals of Data Structures in C, Universities Press,
- 2.Seymour Lipschutz, Data Structures Schaum's Outlines, McGraw Hill

Unit 2

Discrete Mathematical Structures:

Fundamentals of logics, properties of Integers, principles of counting, relations and functions, inclusion and exclusion, graph theory

Reference:

Ralph P, Grimaldi: Discrete and Combinatorial Mathematics, Pearson Education.

Unit 3

Probability and Probability Distribution

Introduction, Addition and multiplication rules of probability. Conditional probability. Random variables –Discrete and continuous. (univariate data) Probability mass functions and probability density functions.

Probability distributions – Random Variable, Joint Probability Distribution, Binomial, Poisson, Normal and Exponential distributions and its applications. Concepts of statistic, parameter, sampling distribution and standard error.

Reference:

Gupta S.C & Kapoor V.K, *Fundamentals of Mathematical statistics*, Sultanchand & sons, 5009.

Unit 4

Operations Research:

Introduction: Operations research model, solving the OR model, art of modeling, phases of OR study. Linear Programming: Formulation of a LP model, graphical solution to LPP, LP applications, standard and canonical form of LPP, the simplex method, Duality and Post-Optimal analysis: Definition of dual problem, primal-dual relationships,

Reference:

Kalavathy, *Operations Research*, Vikas Publication

Unit 5

Software Engineering:

Introduction, requirement engineering,, RUP, UML, software testing, project planning, agile software development.

Reference:

Ian Sommerville: Software Engineering,, Pearson Education

Unit 6

Computer Organization:

Machine instructions and programs, input/output organization, memory, Arithmetic, and basic processing unit

Reference:

Carl Hamacher, honk^o Vranesic, Safwat Zaky, Computer Organization, 5th Edition, Tata McGraw Hill, 2002

Unit 7

Design and Analysis of Algorithms:

Introduction to algorithms, performance, divide and conquer, greedy, dynamic programming, backtracking

Reference:

1. Introduction to the Design and Analysis of Algorithms, Anany Levitin. Pearson.
2. Computer Algorithms/C4—I., Ellis Horowitz, Shirai Salmi and Rajasekaran, Universiuts Press

Unit 8

Operating system:

Introduction, multi threaded programming, Deadlocks, virtual memory management, secondary storage structures and protections,

Reference:

Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles , Wiley-India.

Unit 9

Data Communication and Computer Network; Introduction, Digital transmission, bandwidth utilization, Data link control, media access control, wired LAN and Ethernet. Application layer, Transport layer, Network layer, Network security

Reference:

Behrouz A, Forouzan, Data Communications and Networking
James F Kurose and Keith W Ross, Computer Networking, A Top•Down Approach, Sixth edition, Pearson

Unit 10

System modelling and simulation:

Introduction, statistical modelling, queuing models, random number generation, input modelling, estimation, verification, calibration and validation.

Reference:

Jerry Banks, John S. Carson II, Barry L. Nelson, David M. Nicol: Discrete-Event System Simulation,