TANTIA UNIVERSITY, SRI GANGANAGAR
Syllabus for the Entrance Examination of Ph.D.

Subject- Computer Science

Maximum Marks-100
Part A- 50 (Research Methodology)
Part B- 50 (Subject Wise)

PART-A
Research Methodology and Statistics

UNIT 1:   Meaning of Research
   Aims, nature and scope of research
   Prerequisites of research

UNIT 2:   Research Problem
   Meaning of research problem Sources of research problem Characteristics
   of a good research problem
   Hypothesis: Meaning and types of hypothesis. Research proposal or
   synopsis.

UNIT 3:   Types and Methods of Research
   Classification of Research
   Pure and Applied Research
   Exploring or Formulative Research
   Descriptive Research
   Diagnostic Research/Study
   Evaluation Research/Studies
   Action Research
   Experimental Research
   Historical Research
   Surveys
   Case Study
   Field Studies

Unit 4:   Review of Related Literature
   Purpose of the review. Identification of the related literature. Organizing
   the related literature.

UNIT 5:   Data Collection (Sampling) Sampling and Population Techniques of sampling
   Selection Characteristics of a good sample Types of data.

UNIT 6:   Tools of Data Collection
   Observation, Interview, Questionnaire, Rating scales, Attitude scales,
   Schedules, Characteristics of good research tools.

UNIT 7:   Statistics

Concept of statistics, relevance in education, parametric and non-parametric data; graphical representation of data: histogram, frequency polygon, ogive and pie chart; Measures of Central Tendency: concept, computation and interpretation; measures of variability: concept, computation and interpretation; normal probability curve: concept, application and interpretation.

Correlation: concept, computation and interpretation- Product Moment, Rank Order, Biserial, Point Biserial, Phi, Contingency, Tetrachoric; significance of mean: concept, computation and interpretation of significance of t-test(correlated and uncorrelated, matched, paired-unpaired, matching- paired); ANOVA(One way) :concept, computation and interpretation, regression and prediction; chi square: concept, computation and interpretation (equal and normal probability).

UNIT 8:   Research Report

Format of the research report Style of writing the report References and bibliography

Reference books:

1. Best John W. and James Kahn, V., 1989, Research in Education, Sixth Edition, Prentice- Hall of India Pvt.Ltd, New Delhi.
2. Sharma R.A., 1992, Fundamentals of Educational Research, Loyal Book Depot, Meerut, UP, India.
3. Kulbir Singh Sidhu, 1990, Methodology of Research in Education, Sterling Publishers

    Pvt. Ltd., New Delhi.
4. Lokesh Koul, 1997 Methodology of educational Research, third edition, Vikas Publishing

    House Pvt. Ltd. , New Delhi.
5. Kothari C.R., 1990, Research Methodology Methods and Techniques, Wiley Eastern

    Limited, New Delhi.
6. Borg Walter R., Gall Meridith D., 1983, Educational Research an Introduction, Fourth

    Edition, Longaman, New York &London.
7. Nitko Anthony J., 1983, Educational Tests and Measurement an Introduction, Harcourt

    Brace Jovanovich, Inc., New York.
8. Aggarwal Y.P., 1988, Statistical Methods Sterling Publishers Pvt. Ltd., New Delhi.
9. Garret Hnery E., 1985 Statistics in Psychology and Education, Viakils, Feffer and Simon, Bombay.
10. Guilford, J.P., and Benjamin Fruchter, 1982 Fundamentals of statistics in Psychology and

    Education, Fifth edition, Mc Graw-Hill Book Company, New York.

11. Gupta S.C. and Kapoor V.K., 1999, Fundamentals of Mathematical Statistics, Sultan

      Chand& Sons Educational Publishers, New Delhi.
12. Grewal P.S., Methods of Statistics Analysis, Sterling Publishers Pvt. Ltd., New Delhi.
13. Bruce W. Tuckman, Statistics in Psychology and Education.

Part-B
Computer Science

Advanced Software Engineering:
Software Development Process, Requirement Engineering, System Design Overview, Testing, Web Engineering, and Software Quality Metrics.

Advanced Database Management Systems:
Parallel and Distributed Databases, Web Databases, Data warehousing, Data mining, Object Database Systems, XML, Spatial Data management, Deductive databases, Advanced Transaction Processing.

Wireless Networks and Communication: Introduction:
Frequencies for Radio Transmission, Medium Access Control, Telecommunication Systems, Satellite Systems, Broadcast Systems, Wireless LAN, Wireless ATM, Mobile Network Layer, Mobile Transport Layer, Support Layer for Mobility, Performance Issues.

Computer System Design:
Overview of Parallel Processing and Pipeline Processing, Principles of Scalable Performance, Pipeline Architecture, Vector and Array Processor, Multiprocessor Architecture, Multithreaded Architecture.

Computer Architectural Framework:
Introduction to Object Oriented Systems, Introduction to distributed Objects, Component Object Model (COM), interfaces in COM, Classes and Objects in COM/DCOM, Distributed COM, CORBA, JAVA, and Object Web.

Advanced Computer Algorithms:
Introduction. Algorithm Analysis, Algorithm Design Techniques, Sorting and Searching Algorithms, String Processing Algorithms, Divide and Conquer Method, Greedy Method, Dynamic Programming, Back tracking, Branch and Bound, NP-hard and NP-complete problems

Web Technologies:
Web Environment, XML Primer, XLS, JSP.ASP, Web Technologies, the Web as an Example of Clent Server Computing, Building Web Applications.

Distributed Systems:

Characterization of Distributed System, Interprocess Communication, Distributed Objects and Remote Invocation, Operating System Support, Security, Distributed File System, Name Services, Time and Global States, Co-ordination and Agreements, Transaction and Concurrency Control, Replication, Distributed Shared Memory.

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