



Syllabus for Ph.D Entrance Test -2021

**Unit-I**

**Introduction to Research:** Nature and scope of research methods, meaning, importance and scope. Undertaking research project, the research process, research proposal formulation, research design, type of research design, data collection process.

**Unit-II**

**Sampling techniques:** Sampling theory, Types of Sampling, Steps in Sampling, Sampling and Non sampling error, Sample size, Advantages and limitations of sampling, Collection of data: Primary Data, Secondary Data. Data Collection Methods, Relevance, Limitations.

**Unit-III**

**Probability Theory:** Normal and Exponential Probability Distribution, Correlation and Regression, Sampling procedures, Test of significance, T and Z test, F and Chi Square Test.

**Unit-IV**

**Programming basics:** C, C++ and Java.

**Data Structures:** Abstract data type, Arrays, Stack, Queues, Linked lists, Trees, Searching and Sorting, Asymptotic notion, notion of space and time complexity, Greedy approach, Dynamic programming, Divide and Conquer, Trees and Graph traversals.

**Operating System Concepts:** Processes and Threads, Synchronization, Deadlock, CPU Scheduling, Memory Management and virtual Memory, File Management, UNIX and Linux Operating basics.

**Unit-V**

**Computer Networks and Mobile Communication:** LAN Technologies (Ethernet, Token Ring), Flow and Error control techniques, channel allocation, routing algorithms, TCP/UDP and sockets IPV4 and IPV6, Application layer protocols (DNS, SMTP, POP, FTP, HTTP).

**Mobile Communication:** Generation of Cellular Networks, Cell fundamentals, Handoff, Coverage area.


**Database Concepts:** ER Model, Relational Model, Relational Algebra, Database Design (Integrity constraints and normal forms), Query languages (SQL).

**Unit-VI**

**Operational Research:** Concept Models, Linear Programming Problems (LPP), Exceptional cases in LPP (Degeneracy, Unbounded Solutions, Infeasible solutions, Optimality).

**Theory of Computation:** Finite automation, Transition system, Acceptability of a string by a finite automation, Nondeterministic Finite State Machines, Transducers, Context Free Grammars, Pushdown automata.

**Artificial Intelligence:** Environments, Intelligent Agents, Knowledge Representation, Machine Learning Concepts, Artificial Neural Networks Concepts.

  
Head  
Department of Computer Sciences  
BGSB University, Rajouri (J&K)