Syllabus for Entrance Test for Ph.D. in Information Technology-2024

Fundamentals of IT:
Number system, Binary Arithmetic, Compliments, Conversions, Weighted and Non-weighted Codes, Logic Gates, Boolean Algebra, Boolean Operation and Expressions, Concept of Hardware and Software, System and Application Software, Command and GUI based Operating Systems, IT Act 2000 and Amendments, Social Media and Social Networks.

Programming Languages & Data Structures:
History and Origin of Programming Languages, Categories of Languages, Comparison of Procedural and Object Oriented Programming Languages, Basic Programming Constructs, Data Types and Data Structures, Loops and Conditions, Functions and Pointers, Object Oriented Programming (OOP) Fundamentals, Advanced OOP Concepts, Web Programming, Applets, AWT and JDBC.

Operating System Concepts:
History and Evolution of Operating Systems, Types of OS, Operating System Structure, Process Management Concepts, CPU Scheduling and Algorithms, Inter-process Communication & Synchronization, Deadlocks, Basic Concepts of Memory and Disk Management.

Database Management System:
Basic Concepts & Architecture of Database Management System (DBMS), Characteristics of database, Components of DBMS, Database system Vs file system, Advantages and Disadvantages of DBMS, Data models, Relational Database Design & Normalization.

Software Engineering:
Program vs. Software, Software Characteristics, Software Crisis, Software Engineering Challenges, Software Process Models, Capability Maturity Model Integration (CMMI), Planning, Estimation, COCOMO Model, Software Requirement Analysis & Specification, Software Design, Software Testing.

Data Communication & Computer Networks:
Components of Data Communication, Data Flow, Transmission Impairments, Bit rate and Baud Rate, Transmission Modes, Introduction to OSI Reference Model and TCP/IP Protocol Suite, Transmission Media, Digital Transmission Concepts, Analog Transmission Concepts, Multiplexing, Error Detection and Correction, Framing, Internetworking, IP Addressing, Internetworking Devices and Firewalls.

Cryptography & Network Security:
Security Approaches, Principles of Security, Types of Attacks, Plain Text, Cipher Text, Encryption, Decryption, Key Range, Key Size, Steganography, Cryptographic Techniques, Symmetric Key Cryptography, Asymmetric Key Cryptography, RSA Algorithm, Digital Signatures, Digital Certificates, Internet Security Protocols, Electronic Money, Email Security, Wireless Application Protocol (WAP) Security, User Authentication Mechanism.