COMPUTER SCIENCE AND ENGINEERING

1. Computer Organization: Functional blocks of CPU – Fixed point, floating point number representations –instructions – addressing modes – stored program concept – instruction execution – memory hierarchy – virtual memory, associative memory – cache memory – I/O organization – methods of data transfer – programmed I/O, DMA, Interrupts – IOP

4. C and Data Structures and Algorithm Analysis: Data types, storage classes, operators and expressions – control statements – functions, parameter passing – arrays and pointers, structures, unions – type definitions – pre processor statements – files – Data Structures – Linked Lists – queues and stacks – trees – graphs, sorting : bubble, selection , quick and merge sorts -Searching : linear and binary search techniques, type of algorithms: Greedy, Dynamic, Divide and Conquer, Branch and Bound, NP hard and NP Complete problems.

5. Computer Networks: OSI reference model , TCP/IP reference model –Network topologies : Bus, Ring, Star, Mesh, Hybrid – LAN components – Coaxial, twisted pair, optical fiber cables and connectors – repeaters, hubs, switches, NIC – Ethernet, token bus, token ring, inter network packet exchange/sequenced packet exchange – HTTP, FTP, SMTP, Telnet – TCP/IP addressing scheme – IP address classes - sub netting

6. Operating Systems: Operating system concepts, functions, types, system calls– process management – CPU scheduling algorithms – deadlocks – memory management – overlays, paging, segmentation, virtual memory, page replacement algorithms – disk scheduling – free space management – allocation methods – disk scheduling algorithms

7. RDBMS: Need of database systems, data independence, Data models, E-R model – structure of relational database – normal Forms : 1st, 2nd, 3rd and BCNF – SQL – data types, operators, DDL and DML commands – views, sequences, synonyms, indexes and clusters – PL/SQL – data types, control structures, cursor management, exceptions, functions, procedures and packages

8. Object Oriented Programming concepts : Concept of OOPs – data types, variables, operators, arrays – Classes and objects – methods – constructors – overloading –inheritance - Visibility mode – packages – interfaces – multithreading – exception handling – applets, control and event handling, Python Concepts

9. Software Engineering:

Generic View of Process, Process models, Software requirements, requirement engineering process, system models, Design Engineering, Object-oriented Design, performing user interface design, Testing Strategies, Plans for testing, preparing for the tests. Management of Software Engineering, Software Engineering Tools and Environments. Introduction to UML Concepts.

10. **Theory of Computation and Data Mining**:

Chomsky Hierarchy of languages, Grammars, machines: FA, NFA, PDA and their designs. NP Hard and NP complete problems;

Introduction to Data Mining, Data Warehouse and OLAP, Data preprocessing, Data mining knowledge representation, Attribute-oriented analysis. Data mining algorithms: Association rules, clustering, classification and prediction.

Revised Syllabus CSE

MODEL PAPER FOR PHD ENTRANCE

Subject: COMPUTER SCIENCE & ENGINEERING

1. The number of binary bits required to represent a digit of octal number is
   A) 2 B) 3 C) 4 D) 6

2. The goodness of an algorithm is most often expressed in terms of its
   A) Best Case complexity B) Average Case complexity
   C) Worst Case complexity D) Random case complexity

3. The minimum time will be taken by the algorithm of complexity
   A) n(log n)3 B) n/log2n C) n3 logn D) n2 log2n

4. The process of giving several meanings to an operator or a function is known as
   A) Abstraction B) Overloading C) Encapsulation D) Binding

5. Which class of IP address allows the largest number of networks, but least number of hosts
   A) Class A B) Class B C) Class C D) Class D

6. The following grammar is
   $S \rightarrow a\alpha b \mid b\alpha c \mid aB$
   $S \rightarrow aS \mid b$
   $S \rightarrow \alpha bb \mid ab$
   $b\alpha \rightarrow bdb \mid b$
   (a) context free (b) regular (c) context sensitive (d) LR (k)

7. Markup tags tell the web browser
   (a) how to organize the page (b) how to display the page
   (c) how to display message box on page (d) none of these

8. To use a template class member function, use the _____ with the instantiation.
   (a) scope resolution operator (b) dot operator (c) class definition (d) key word template

9. The first-fit, best-fit and worst-fit algorithm can be used for
   (a) contiguous allocation of memory (b) linked allocation of memory
   (c) indexed allocation of memory (d) All of the above

10. In spiral model of software development, the primary determinant in selecting activities in each iteration is
    (a) Iteration size (b) Cost (c) Adopted process (d) Risk