CSE335:COMBINATORIAL STUDIES-III

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: solve various problems on Boolean algebra laws, duality theorem, consensus theorem, positive and negative logic, boolean logic, minimization of Boolean function, combinational circuits, and Sequential circuits."

CO2 :: solve various problems on conversions of number system, Complement of a number, Representation of negative numbers, The IEEE standard for floating point numbers, main memory, secondary memory, cache memory, and cache mapping techniques

CO3 :: solve problems of computer architecture and CPU control design.

CO4 :: recall fundamental concepts of computer networks and solve various problems.

CO5 :: demonstrate the ability to solve problems on network security, IPv4/IPv6 networking, subnetting, and routing algorithms

CO6 :: demonstrate the ability to solve problems on ER-model, relational model, structured query language (SQL), transactions and concurrency control, file organization, and indexing.

List of Practicals / Experiments:

Boolean Logic

- Boolean algebra laws
- Duality theorem
- Consensus theorem
- Positive logic and negative logic
- Introduction to Boolean logic
- Minimization of Boolean function

Digital Circuits

- Combinational circuits
- Sequential circuits

Number System

- Conversions of number system
- Complement of a number
- Representation of negative numbers
- The IEEE standard for floating point numbers

Memory Hierarchy

- Main memory
- Secondary memory
- Cache memory
- Cache mapping techniques

Computer Architecture

- Introduction to computer architecture
- Register set
- Machine instructions and addressing modes
- Arithmetic logic unit

- I/O interface (interrupt and DMA mode)
- Instruction pipelining

CPU Control Design

- Instruction execution
- CPU data path
- Control unit design
- RISC versus CISC processors

Computer Networks

- Concept of layering
- LAN technologies (Ethernet)
- Flow and error control techniques
- switching
- TCP/UDP and sockets
- congestion control
- Basics of Wi-Fi

Network Security

- Authentication Mechanisms
- Basics of public key and private key cryptography
- Digital signatures and certificates
- Firewalls

Networking

- IPv4/IPv6
- Subnetting
- Routers and routing algorithms

Databases

- ER-model
- Relational model: relational algebra, tuple calculus, Integrity constraints, and normal forms, structured query language (SQL)
- File organization, indexing (e.g., B and B+ trees)
- Transactions and concurrency control
- structured query language (SQL)

Text Books:

1. WILEY ACING THE GATE COMPUTER SCIENCE AND INFORMATION TECHNOLOGY by ANIL KUMAR VERMA, GAURAV SHARMA, KULDEEP SINGH, WILEY

References:

1. DATABASE SYSTEM CONCEPTS by HENRY F. KORTH, ABRAHAM SILBERSCHATZ, S. SUDARSHAN, Mc Graw Hill Education

2. DATA COMMUNICATIONS AND NETWORKING by BEHROUZ A. FOROUZAN, Mc Graw Hill Education

3. COMPUTER ARCHITECTURE AND ORGANIZATION by JOHN P. HAYES, Mc Graw Hill Education

4. DIGITAL LOGIC DESIGN AND COMP ORGANIZATION by NIKROUZ FAROUGHI, MC GRAW HILL

5. GATE COMPUTER SCIENCE AND INFORMATION TECHNOLOGY by TRISHNA KNOWLEDGE SYSTEMS, Pearson Education India