DCS-401 - COMPUTER NETWORKING

UNIT-I

Introduction to Pc Hardware: Definition & historical review n of network, Network criteria, Network Applications, Definition of Protocol, Standard organization,(ISO, CCITT, ANSI, IEEE, ITU, ISOC, IETF).

UNIT-II

Basic Concepts:-Line Configuration-Point to point, Multipoint, **Topology-**Mesh,Star,Ring, Bus, Tree, **Categories of network-**LAN, WAN**,** MAN**,** ITERNETWORKS, **Different types of servers:** File**,** Application**,** Print**,** Mail**,** Proxy**,** Web servers

UNIT-III

The Reference Model: OSI model & function of each Layer, TCP/ IP model, Comparison of OSI & TCP/IP, **Transmission Media:** Guided Media, Unguided media

UNIT-IV

Networking: Network devices, Network Adapters, Hubs, Switches, Routers, Access Points, Gateways, Network software, Wired Network, Wireless Networks, Bridges

Network & Transport Layer in Internet: IP protocol, IP V4 Header & protocol functions, IP addressing schemes, Subnet & subnet masking

UNIT- V

Network Applications & Security: DNS (Domain Name System), , File transfer protocol & Trivial FTP, Electronic Mail, Functions of E-mail systems (mail box & address), User agents, Message format, Mail Protocols (SMTP, POP, IMAP, MIME), **Firewall:** Packet Filter Firewall, Proxy Firewall, Cryptography, Symmetric Key cryptography, Public Key Cryptography

REFERENCES:-

 1. Computer Network, by Andrew Tannebaum Pearson.

2. Data Communication & Networking, by Forouzen TMH.

3. Computer and Communication Networks, by Nader F. Mir Pearson.

 4. Data Communications & Computer Networks for Computer Scientists & Engineers , by Michael Duck Pearson.

DCS-402 - DATA BASE MANAGEMENT SYSTEM

UNIT-I

DATABASE CONCEPTS : Introduction to database and database management system, . Disadvantages of file system data management, Database system applications, Advantages and disadvantages of DBMS, **Three level architecture:** Mapping between views , data independence, DBMS users and administrators, DBMS Architecture, DML, DDL & DCL.

UNIT-II

DATA MODELS: Introduction to data models, Entities, attributes & association, Relationship among entities, representation of association & relationship, Entity-Relationship model: Entity sets, relationship sets, constraints, E-R diagram, Entity- Relationship design issues, Generalization, Specialization & aggregation, Relational Model: Attributes and Domains, tuples, relations and their schemas, relation representation, keys, relationship, integrity rules, Codd's Relational database rules.

UNIT-III

DATABASE DESIGN CONCEPTS & NORMALIZATION: Relational algebra: Basic operation, select, join, projection, additional relational algebra, queries. **Functional dependency:** Definition, inference axioms for functional dependency, closure, cover and equivalence of FD, Referential integrity. **Normalization:** Introduction to Normalization, NF, Data anomalies in 1 NF, Partial dependency, 2 NF, Data anomalies in 2 NF, Transitive Dependency, 3NF, Data anomalies in 3 NF, Boyce-Codd Normal Form, Lossless or Lossy Decomposition.

UNIT-IV

ADVANCE DATABASE CONCEPTS: Introduction to transactions, Introduction to concurrency control, Data mining & Data Warehousing, Distributes & Object based database, Introduction to Cloud based database. **INTRODUCTION TO SQL**: Introduction to SQL language, Structure of SQL statements & SQL writing guidelines, Data Definition commands, describing the structure of a table, Data manipulation commands, Basic structure of SQL queries.

UNIT-V

ADVANCED IN SQL : SQL query structure for selection & join operators, defining primary keys, foreign keys in a table, CHECK constraints, removing constraints from table, SQL functions: SUM(), AVG(), MAX(), MIN(), COUNT(), Introduction to Triggers, stored procedures & views.

REFERENCE BOOKS:

1. Galgotia Publication Pvt. Ltd., New delhi.

2. Ashutosh Kumar Dubey " Database Mangement Concepts" S.K.Kataria & Sons, New delhi.

3. Date C.J., An Introduction to Database Systems, Narosa.

5. Leon, SQL complete reference, TMH.

LIST OF EXPERIMENTS:-

1) Study of DBMS, RDBMS and ORDBMS.
2) Study of various type of SET OPERATORS (Union, Intersect, Minus)
3) Study of various type of Integrity Constraints.
4) Study of Various type of JOINS.
5) To study Views and Indices.
6) Execute Data Definition SQL commands like create table.
7) Execute Data Manipulation SQL commands like insert, update, delete data from single & multiple tables.
8) Creating users, granting & revoking permission, set roles to users.
9) Basic PL/SQL program using flow control statement functions.
10) Creating triggers, stored procedure and cursors.

DCS-403 - LINUX AND SHELL

UNIT-I

Introduction to Unix:- Architecture of Unix, Features of Unix, Basic Unix Commands - Unix Utilities:- Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands - Text processing utilities and backup.

UNIT-II

Introduction to Shells:- Unix Session, Standard Streams, Redirection, Pipes, tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization. Regular expressions, Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, words or lines, Comparing Files.

UNIT-III

Grep:- Operation, grep Family, Searching for File Content. sed:-Scripts, Operation, Addresses, commands, Applications, grep and sed. awk:-Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, Mathematical Functions, User Defined Functions, Using System commands in awk, Applications of awk, grep and sed.

UNIT-IV

Interactive Shells - Korn Shell, C Shell and BASH - Shell Features, Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process. Shell Programming - Korn Shell, C Shell and BASH - Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

UNIT-V

Process management:- Creation, Hierarchies, Sending signals to processes, exec, termination, Zombie, waitpid etc - Network management:- tools, Client server mechanism, address resolution, ping, telnet, ftp, dns and squid – X Window System:- Overview, Architecture, starting and stopping X, X clients and display.

REFERENCES

1. Behrouz A. Forouzan, Richard F. Gilberg," Unix and shell Programming.", Cengage Learning

2. Sumitabha Das, "Unix the ultimate guide", TMH. 2nd Edition.

3. Kernighan and Pike, "Unix programming environment", PHI. / Pearson Education

List of Experiments:-

1. Installation of Unix/Linux operating system.

2. Study of logging/logout details.

3. Study of vi editor

4. Study of Bash shell, Bourne shell and C shell in Unix/Linux operating system.

5. Study of Unix/Linux file system (tree structure).

6. Write a shell script program to display list of user currently logged in.

7. Write a shell script program to display "HELLO WORLD".

8. Write a grep/egrep script to find the number of words character, words and lines in a file.

9. Write an awk script to develop a Fibonacci series.

10. Write an awk script to display the pattern of given string or number.

DCS-404 – MICROPROCESSOR & INTERFACE

UNIT-I

Register Organization of 8086: General Data Registers, Segment Registers, Pointer and Index Registers, Flag Register,

Internal Organization of 8086: Bus Interface Unit (BUI),Execution Unit (EU), Memory Segmentation, Flag register and description of all flag bits.

Signal description of 8086: Physical memory organization, General Bus operation, I/O Addressing capability, Special processor activities, Minimum mode and Maximum mode of 8086

UNIT-II

8086 Assembler Directives: Introduction, Symbols, Variables and Constants, Data Definition and storage allocation directives, Program organization directives, Alignment directives, Value-retrieving attribute directives, Procedure definition directives, Macro definition directives, Data control directives Branch displacement directives, Header file inclusion directives.

UNIT-III

8086 Instruction set: Machine language instruction formats, **Addressing modes of 8086:-** Immediate addressing mode**,** Implicit addressing mode**,** Direct addressing mode**,** Indirect addressing mode Register Addressing Mode**,** Register Indirect**,** Based IndexedRegister Relative**,** Relative Based Indexed. Assembler instruction format**,** Data transfer instructions Arithmetic and Logical Instructions**,** Shift and Rotate instructions**,** Branch instructions**.** Processor control instructions**,** String operation instructions.

UNIT-IV

8086 Assembly Language Programming: Introduction**,** Program Segment**,** Procedures**,** Program Structure**,** Programming with macros, Input-output structure and programming**,** Program development tools**,** Program development process**,** ASCII and Integer conversion

UNIT-V

Advance Processor: Intel Pentium Processor**,** Block Diagram**,** Organization**,** Integer Pipelined.

Reference Books:
1. Advance Microprocessor and Peripherals, A.K. Ray, K.M. Bhurchandani TMH.
2. Microprocessor X86 Programming, K.R. Venugopal, Rajkamal. BPB.
3. The 8086 microprocessor Architecture, Programming and interfacing, Das Person.
4. 8085 Microprocessor, R S Gaokar.
5. The 8085 microprocessor Architecture, Programming and interfacing, K. Uday kumar Pearson.

LIST OF EXPERIMENTS:

1. Introduction to microprocessor 8086 & 8086 SDK.

2. Write a logic program for the addition & subtraction of two numbers with & without carry/borrow.

3. Write a logic program for the multiplication & division of numbers signed & unsigned both.

4. Write a logic program to find the square of a number without using multiplication instruction.

5. Write a logic program to find square of a number using look-up table.

6. Write a logic program to find the factorial of a given number.

7. Write a logic program to generate Fibonacci Series.

8. Write a logic program to find the smallest number in given stack of data.

9. Write a logic program to arrange the given stack in ascending order.

10. Write a program to check the given number is even or odd.

DCS-405 – DISCRETE STRUCTURES

UNIT-I

Set Theory, Relation, Function, Theorem Proving Techniques : Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, **proofs of some general identities on sets Relation:** Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation, **Job-Scheduling problem Function:** Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions, pigeonhole principle. Theorem proving Techniques: Mathematical induction, Proof by contradiction.

UNIT-II

Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.

UNIT-III

Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Normal Forms, Universal and existential quantifiers. Introduction to finite state machine Finite state machines as models of physical system equivalence machines, Finite state machines as language recognizers.

UNIT-IV

Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs.

UNIT-V

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices. Combinatorics: Introduction, Permutation and combination, Binomial Theorem, Multimonial Coefficients Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms, Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions, Generating functions , Solution by method of generating functions.

References:

 1. C.L.Liu, "Elements of Discrete Mathematics" Tata Mc Graw-Hill Edition.
2. Trembley, J.P & Manohar; "Discrete Mathematical Structure with Application CS", McGraw Hill.
3. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill.
4. Bisht, "Discrete Mathematics",Oxford University Press
5. Biswal,"Discrete Mathematics & Graph Theory", PHI