

Data Base Management System

(BCA-301)

Unit - I: Introduction: Database system concepts, Database Users, and Architecture Introduction to Database System with example, Introduction to Traditional File Oriented System, Characteristics of the Database Approach, Components of Database System, Database users, Advantages and disadvantages of using a DBMS, structure of DBMS, Database Schemas and Instances, DBMS Architecture, Data Independence, Database Languages and Interfaces, Classification of Database Management Systems.

Unit II: Data Modeling & Relational Database Management System Data Modeling using the Entity Relationship Model: Entity Types, Entity Sets, Attributes, Keys, Relationships, Relationship Types, Role and Structural, Constraints, weak Entity Types, ER Diagrams, Naming Conventions, Design issues.

Unit III: The Relational Data model: Relational Constraints and the Relational Algebra: Relational Model Concepts, Relational Constraints and Relational database Schemas update Operations and Dealing with Constraint Violations, Basic Relational Algebra Operations, Additional Relational Operations, and Examples of Queries in Relational Algebra.

Unit IV: SQL: SQL and Database Design Theory and Methodology Structured Query Language The Relational Database Standard: Data Definition, Constraints and schema Changes in SQL,

Types of SQL Commands, SQL Operators and their Procedure, insert, Delete, and Update Statements in SQL Queries and Sub Queries, Aggregate Functions, Joins, Unions, Intersection, Minus Views (Virtual

Tables) in SQL. Functional Dependencies and Normalization of Relational Database: Informal Design Guidelines for Relation Schemas,

Functional Dependencies, Armstrong Rules, Closure of Attributes, Normal Forms Based on Primary Keys, General Definitions of Second and Third Normal Forms, Boyce Codd Normal Form.

Unit - V: Transaction Processing: Concurrency Control and Distributed Database Transaction Processing Concepts: Introduction to Transaction Processing, Transaction and system concepts, Desirable Properties of Transactions, Concurrency Control Techniques, Locking Techniques for concurrency Control, Concurrency Control Based on Timestamp Ordering.

E-Commerce & ERP

(BCA-302)

Unit - I: Introduction: Defining E-Commerce, Main Activities of Electronic Commerce, Benefits of E-Commerce, Goals of Electronic Commerce, Main components of E-Commerce, Functions of Electronic Commerce, Communication, Process Management, Service Management, Transaction Capabilities, Process of E-Commerce, Types of E-Commerce, Role of internet and web in E-Commerce, Technologies Used in E-Commerce Systems, Scope of E-Commerce, E-Business Models.

Unit II: E-Commerce Activities: Various Activities of E-Commerce, Various Modes of operation Associated with E-Commerce, Matrix of E-Commerce Types, Elements and Resources Impacting E-Commerce and Changes, Type of E-Commerce Providers and Vendors, Man Power Associated with E-Commerce Activities, Opportunity Development for E-Commerce Stages, Development of E-Commerce Business Case, Components and Factors for the Development of the Business Case, Steps to Design and Develop and E-Commerce Website.

Unit - III: Internet: The Backbone for E-Commerce: Early Ages of internet, Networking Categories, Characteristics of Internet, Components of Internet, Internet Services, Elements of Internet, uniform Resource Locators, Internet protocol, Shopping Cart, Cookies and E-Commerce, Web Site Communication, Strategic

Capabilities of internet. Implementation of E-Commerce: WWW, EBAY, COM, B2B website registration, Time factor, Bidding process, Growth of eBay, Paypal, New Trend in making Payments Online- National Electronic Fund Transfer.

Unit - IV: ISP, WWW and Portals: Internet Service Provider

(ISP), World Wide Web (WWW), Portals, Steps to build homepage, Metadata, Advantages of Portal, Enterprise Information Portal (EIP), E-Marketing: Traditional Marketing, E-Marketing. Identifying Web Presence Goals, Achieving Web Presence goals, Uniqueness of the Web, Meeting the needs of website visitors, Maintaining a website, Metrics Defining internet units of Measurement, Online Marketing, Advantages of online Marketing, Content: Format and access, Maintaining a website. Metrics Defining Internet Units of Measurement Online Marketing, Advantages of Online Marketing, E-Security: Security on the internet, Network and website Security Risks, Denial of service attacks, viruses, unauthorized access to a computer network, vulnerability of internet sites, network and website security, Transaction security and data protection, Security audits and penetration testing, E-Business Risk Management issues, Firewall, Network, Policy, Advanced authentication mechanism, Packet filtering, Application gateways, Defining enterprise Wide Security Framework.

Unit-V: E-Payment Systems: Electronic Funds Transfer, Digital

Token Based E-Payment Systems, Modern Payment Systems, Steps for Electronic Payment, Payment Security, Net Banking, Customer Relationship Management: Customer Relationship Management (CRM), Marketing automation, Enterprise customer management, customer relationship Management Areas, CRM

Processes, Event triggers, business logic and rules repository,
Decision support tools, Higher level statistical analysis, Collateral
management, Electronic Customer Relationship Management, Need,
Architecture and Applications of electronic CRM.

Computer Organization & Architecture

(BCA-303)

Unit - I: Computer Evolution: Brief history of Computer,

Classification of computer, Structure of a computer system, Arithmetic Logic Unit, Control Unit, Von Neumann Architecture, Integer Addition and Subtraction, Floating point representation, Signed numbers, Binary Arithmetic 1's and 2's Complements, Booths Algorithm, Hardware Implementation, IEEE Standards, Floating. Point Arithmetic, The accumulator, shifts, carry and overflow instruction Characteristics, CPU with single BUS, Types of operands, Types of operations, Addressing Modes, instruction Formats.

Unit - II: Processor Organization: Parallelism and Computer

arithmetic, Computer arithmetic associatively, Floating Point in the 8086, Programmers Model of 8086, Register Organization, 8086 Registers, Instruction Cycles, Addressing Modes, Micro operations, The instruction cycle, Control of the CPU, Functional Requirements, Single, Two, three bus structure, Execution of a complete instruction, Branching, Sequencing of Control Signals, Hardwired Control Unit, Micro — Programmed Control.

Unit - III: Memory Organization: Characteristics of Memory

Systems, Main Memory, Types of memory, Memory system considerations, Design of memory subsystem using Static, Dynamic Memory Chips, Memory interleaving High Speed Memories: Cache Memory, Structure of cache and main memory, Elements of Cache Design, Mapping functions, Replacement algorithms, External Memory, Virtual memory.

Unit - IV: I/O Organization: Input/ Output Module: Need, Techniques, Interrupt Driven I/O, Basic concepts of an Interrupt, Response of CPU to an Interrupt, Design issues, Priorities, interrupt handling, Types of interrupts. Data transfer Techniques, Data memory Access, Buses, Types of buses, I/O interface, synchronous and Asynchronous Data Transfer, serial I/O, Input Devices, Output Devices, Multi-programming vs. Multiprocessing, Comparison between loosely coupled and tightly coupled multiprocessor..

Unit -v: Micro-programming: Basic Principles, Features, Hardwired vs. Micro programmed computers, Applications and advantages of micro programming, Limitations of microprogramming, Computer Clock, Micro instructions and its Control Path, Microcode, Machine instruction. Parallel Organization, Instruction Set Architecture (ISA), RISC and CISC, Characteristics of CISC, Characteristics of RISC, RISC versus CISC, vector Processing requirements and characteristics of vector processing,

Operating System With Unix and Window

(BCA-304)

Unit-1: Introduction: What is an operating system? Simple Batch Systems.

Mult, Programmed Batch Systems, Time Sharing System, Personal Computer systems, Parallel Systems, Distributed Systems, Real Time Systems, Memory Organization: Fixed memory »» variable memory, Memory Management: Background, Logical versus physical Address space, swapping, Contiguous allocation, paging, Segmentation Virtual memory: Demand Paging, Page Replacement, Page replacement Algorithms, Performance of Demand Paging, Allocation of Frames. thrashing.

Unit -II: Processes: Process Concept. Process Scheduling, operation on processes, CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple. Processor Scheduling, Process Synchronization: Background, the critical. section problem, synchronization Hardware, Semaphores, Classical Problems of synchronization. Deadlocks: system Model Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

Unit -III: Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices, Input or Output Devices, Storage Devices, Buffering. Secondary Storage Structure: Disk Structure, Disk Scheduling. Disk Management, Swap, Space

Management, Disk Reliability

Information Management: Introduction, A simple file system, General Model of a File system, Symbolic File System, Basic File System, Access Control Verification, Logical File System. Physical File System File System Interface. File Concept, Access Methods, Directory Structure, Protection, Consistency Semantics File, System Implementation: File, System Structure, Allocation Methods, Free Space Management.

Unit- IV: Unix: A Sample Login Session, Logging On, Using the on — line Man pages, Logging Off, Directory and File Structure, File Names, Directories, The df Program, Your Login Directory, Subdirectories, Specifying Files, Protecting Files and Directories, Text Editors, Files as Output and Log files, Logging Your Actions to a File, Comparing Files, Searching Through Files, The Systems and Dealing with Multiple Users.

Unit -V: Windows: Features of windows desktop, start menu, control panel, my computer, windows explorer, accessories, Managing Multiple Windows, arranging icons on the desktop, creating and managing folders, managing files and drivers, logging off and shutting down windows Entertainment CD player, VCD Player, media player, Sound recorder, volume Control.

Elements of Statistics

(BCA-305)

UNIT-I: Population, Sample and Data Condensation : Definition and scope of statistics; concept of population and sample with illustration, Raw data, attributes and variables, classification, frequency distribution, Cumulative frequency distribution,

UNIT-II: Measures of Central Tendency : Concept of central Tendency, requirements of a good measures of central tendency, Arithmetic mean, Median, Mode, Harmonic Mean, Geometric mean for grouped and ungrouped data.

UNIT-III: Measures of Dispersion: Concept of dispersion, Absolute and relative measure of dispersion, range variance, Standard deviation, Coefficient of variation.

UNIT-IV: Permutations and Combinations : Permutations of " n " dissimilar objects taken r at a time (with or without repetitions). $P = \frac{n!}{(n-r)!}$ (without proof). Combinations of r objects taken from ' n ' objects. $C = \frac{n!}{r!(n-r)!}$ (without proof) . Simple examples, Applications.

UNIT-V: Sample space, Events and Probability : Experiments and random experiments, Ideas of deterministic and non-deterministic experiments; Definition of sample space, discrete sample space, events;

Types of events, Union and intersections of two or more events, mutually

exclusive events, Complementary event, Exhaustive event; Simple examples. Classical definition of probability, Addition theorem of probability without Proof (upto three events are expected).

Definition

of conditional probability Definition of independence of two events, simple numerical problems.

UNIT-VI: Statistical Quality Control - Introduction, control limits, specification limits, tolerance limits, process and product control; Control

charts for \bar{X} and R. Control charts for number of defective {n-p chart

Control charts for number of defects per unit