Madhya Pradesh Bhoj (Open) University
B.SC (IT) (Second Year)
Syllabus
BIT - 09 : Database Management Systems

Unit – I
DBMS: An Introduction, Data Base Management System-Basic Concepts, Data and Database, Database System: Concept and Meaning, Disadvantages of File Systems, Advantage of Database Approach, Disadvantages of Using a DBMS, Database Languages, Database Administrator, Database Designers, Database Users., Database Manager, Data Base Management System-Architectures and Features, Data Abstraction, DBMS Architecture, Data Independence, System Architecture, Data Model.

Unit - II
Entity Relationship Model: Entities and Relations, Entities and Entity Sets
Attributes, Relationships, Design Choice, Key, ER-diagram, The Entity Relationship Diagram, Types of Attributes, Role, Attribute of Relationships, Participation, Cardinality Constraints, Multiple Relationships, Keys, Weak Entity Sets, EER- model, Specialization and Generalization, Constraints on Specialization and Generalization, Aggregation, Simplification, Constraints beyond the ER Model,

Unit – III
Relational Data Model: Relations, What is Relation?,Different Features of a Relation, Relation Scheme, Constraints, Entity Integrity Constraints, Referential Integrity, Relational Algebra-I, Operands of Relational Algebra, The Selection Operator, The Projection Operator, Union, Intersection and Set- Difference, Cartesian Product, The Renaming Operator, Completeness of Relational Algebra, Relational Algebra-II, The Join Operator, Division Operator, Database Modification, Relational Operations are Closed, Outer Join, Generalized Projections, Aggregate Functions, Implementing Relational Algebra Operations, Relational Calculus, Tuple Relational Calculus, Domain Relational Calculus, Domain versus Tuple Calculus, Relational Calculus versus Relational Algebra.

Unit – IV
Relational Database Design : Functional Dependencies, Anomalies in Databases, Functional Dependencies, Inference Rules fur FDs, Attribute Closure, Normal Forms, Normal Forms, First Normal Form, Second Normal Form, Third Normal Form, BoyceCodd Normal Form, Decomposition and Other Dependencies, Attribute Preservation, Loss-Less Join Decomposition
Dependency Preservation, Multi-Valued Dependency, Join Dependencies, The Process of Normalization

Unit – V

Concurrency and Recovery: Transaction Processing What is Transaction?, Properties of Transaction, Major Actions of a Transaction What is Recovery?, Concurrent Execution of Transactions System Log. Concurrency Control, What is a Schedule?, Recoverability of Schedules, What is Serial Schedule?, Serializable Schedule, Recovery Procedures, Structures for Recovery Procedures, Log with Deferred Updates, Logging with Immediate Updates, Check pointing, Recovery, Conflict Serializability, Lock based Concurrency Control, Two Phase Lock protocol, Deadlock, Deadlock Prevention, Deadlock Detection, Livelock, Timestamp Ordering, Optimistic Concurrency Control.

SQL: A Query Language: Data Definition With SQL, SQL Schema Definition, Table Definition, Column Definition, Data Types in SQL, Domain Definition, Table Constraints, Modification, Catalog, Basic SQL Queries, Basic SQL Query, Union, Intersect, Nested Queries, Aggregate, Operators, GROUP BY and HAVING Clause, Joined Relations, Joined Conditions, Advanced Topics: Embedded SQL, Host Variable Definition, Embedded Exception Declaration, Cursors, SQL Procedure Statements,Dynamic SQL, Java as the Host La_,

BIT – 10 : **Visual Basic**

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Visual Basic at a Glance: Program Design and Implementation, Introduction to Visual Basic, Hardware and Software Requirements of Visual Basic, Terms Often used in Visual Basic, Programming in Visual Basic, Editing and Writing Code in the Code Window, Programming an Application, **The Integrated Development Environment:** The Visual Basic, ToolBars, Customizing a Toolbar, Menu Bars, The Project Explorer, The Properties Window, The Code Window, The Form Window, The Debug Windows, The Toolbox Window Adding/Removing Custom Controls to the Toolbox, Organizing the Toolbox, Using the Application Wizard, Resource Files, Projects, Form Files, Creating a New Project, Saving the Project, Creating a Project Group.

Unit - II

The Language Reference: Knowing Visual Basic, Summary of Data Types, Variables, Deft._e Statements, User Defined Data Types, Constants, Operators, Control Flow Statements, With-End with Statements, Arrays, **Error Handling, Debugging and Sorting Techniques:** Possibilities of Errors, Using Coding Conventions and Putting Comments, Debugging, Handling Errors, Exit Statements, List of Some Trappable Errors, Sorting Techniques, Implementing Algorithms.

Unit - III

Object Oriented & Event Driven Programming in Visual Basic: Object Oriented Programming, Objects and Classes, Few Terms Used in OOP, Object Linking and Embedding (OLE), Component Object Model, Creating Object Variables, Creating Control Arrays, Detecting Controls **Forms and Menus:** Form's Basics, Important Properties of Forms, Forms Collection Controlling One Form Within Another - MDI, Using an MDI Form, Menus and the Menu Editor, Pop-Up Menus, Example on Using Pop-Up Menus.

Unit - IV

Dialog Boxes Displaying, Dialogs Creating a Modal Dialog Box The Message Box, Common Dialog Boxes, The InputBox,

Using Basic Controls: Basic Controls, Introducing Label Control, The Text Box Control, The List Box and Combo Box Controls, Radio Buttons and Check Boxes, Scroll Bars, Example Using Option Buttons, Check Boxes and Scroll Bars, Timer Control Running Lights Application, Creating a Flying-

Message Application, Image Control.

Unit - V
Using Enhanced Controls: The Directory List Box, The Drive List Box, The File List Box, Copying and Searching Files, The Rich Text Box Control, Creating a Preview Document Application, The Key St ntrol, The Status Bar Control, Progress Bar
 New ActiveX Controls: ActiveX Controls, Image List Control, The Toolbar Control, The Coolbar Control, ImageCombo Control, The Month View Control, The ListView Control, Example Using a ListView Control, TreeView Control, Example Using TreeView Control, Microsoft Masked Edit Controls, The FlatScrollBar Control, The

BIT - 11: Computer Networks

Unit – I
Fundamentals of Data Communication: Analog Versus Digital, Fundamentals of Data Transmission Communication Modes Transmission System, Synchronous System, **Communication Channnels-Modems** : Classification of Modems Modem Based on Range Modems Based on Line Modems Based on Operation Mode Modems Based on Synchronization Modems Based on Modulation.
Data Transmission Protocol: Protocols An Overview of Networking The Role of Computer Networks in Development.

Unit - II
Transmission Media: Introduction Transmission Concepts and Terms J\1aster Sites Interconnection to Telephone.
Local Area Network: Local Area Network Baseband Versus Broadband LAN Hardware LAN Operating Systems.
Implementing LAN : Implementation of LAN Using Fiber-Optic Cables Implementation of LAN Using Wireless Technology Fast LANs Non-standard LANs.
Extending LAN : Transmission Concepts and Terms, Master sites, Interconnection to Telephone.

Unit - III
Data Transmission Network: Telephone Networks, Wan Technologies.
TCP lIP and the Internet: History of Internet, Internet2 Internet Services Standards for TCP lIP and the Internet RFCS and the TCP lIP Standardization Process.
NetWork Architectures and OSI, Network Architectures Layering the Communications Process The Need for Layered Solutions Open Systems Interconnection (OSI) Model.

Unit - IV
Routing and Congestion Control: Routing Concepts Routing in Wide Area Networks Hop-By-Hop versus Source Routing Congestion Control, Deadlocks. **Queueing Theory: Basic Design Techniques:** Basic Concepts, Queueing Model and Factors Traffic Theory Lost Call Rate.

Unit - V
Wide Area Network: Introduction Network Using WAN and Network Services Communication Protocols Over WAN.
Transmission Control Protocol/Internet Protocol (TCP lIP) : LAN Protocol and OSI TCP lIP Protocol Data Transmission by TCP and Ethernet Data Encapsulation Data Routing TCP lIP Services and Application Protocols.
Data Link Layer Address: Physical Address. **Naming, Addressing, and Routing:** NetWork Layer Addresses Subnet Address Resolution Protocol (ARP) Domain Name

BIT - 12: Internet Technology

Unit - I

Introduction to Internet: From network to Internet, Development of Internet, Services of Internet, Uses of Internet, Internet and Internet.

Network Protocols and Standards: Introduction, Open System, Standards, Network Architecture, OSI reference Model, OSI RM and DOD Networking Model, How OSI Model Works.

Unit - II

TCP and IP : Network Protocols and TCP *lIP,* Features of TCP *lIP,* TCP *lIP* protocol suit, function of TCP, Communication process phases, how TCP *IIp* works, protocol Headers, TCP protocol Data Units, TCp connection.

Internet Addressing: Internet Protocol (IP), IP function, The IP Header, The Structure of the Internet, Internet Addressing, Address Resolution Protocol(ARP), ARP and IP Addresses, The Domain Name System, IP Next Generation, The Types of Internet Connections.

Unit - III

LAN and WAN: Introduction, Local Area Network, LAN topologies, LAN Transmission Formats, Wide Area Networks.

Communications Interface Technology: Transmission Media (Cable or wire less media, twisted pair cables, coaxial able, fiber optic cable, wireless transmission)., LAN Interfaces, Internetworking Devices (Bridge, Features of Bridge, Router).

Unit - IV

Internet Access, Mail Services and Settings: Internet Service Providers (ISP), E-mail Services, Internet Connections configurations, Establishing a Dial-Up Internet Connection, Setri11g Up Internet Mail.

Internet Information Services and Components: FTP, Telnet, HTTP, Gopher.

Unit-V

Web Technologies: Introduction, World Wide Web, Web Browsers, Web Server, Internet Phones, Internet Chatting. Conducting business on web, e-commerce.

BIT: 13

Management Information Systems

UNIT -I

Principles of management Evolution, development and modem philosophy of management, Principles of Management, Nature and functions of management, Planning, Organizing, Directing, Communicating, Controlling and Coordinating, Motivation and Leadership.

UNIT-II

Management information system - Introduction, Characteristics, Needs, Different views of MIS, Designing, Placement of MIS, Pitfalls in Designing an MIS

Reporting -Capabilities. Principle, Type of Reports, Presentation on Modes, Function reporting system, Information and its uses, Characteristics of information, flow of information.

UNIT-III

Introduction & types of Decision

Levels of Decision making

Decision support system - Concepts, Types, Software, Components, Needs, Building, Problems, Examples, Impact.

UNIT-IV

Conc'epts, Artificial Intelligence and Expert system

Basics of Expert system

Building of Expert system

Merits and Demerits of Expert system

Application of Expert system

UNIT -V

Computer Application in Business - Need and Scope, Cost and Budgetary Control, Inventory Control System, Payroll and Personnel Record, Banking, Insurance and Stockbroking, Mathematical Models

BIT-14 Core Java

Unit - I

The Genesis of Java, Introduction and Creation, Applets and Applications, Security, Bytecodes, Java Buzzwords, Simple, Multi-threaded, Architecture Neutral, Java and Java Script, New in JDK, An Overview of Java, What is an Object, Features of Object Oriented Programming, The First Simple Programme, Compiling, Data Types, Variables and Arrays, Data Types in Java, Literals, Characters, Variable Declaration, Symbolic Constants, Type Casting, Arrays, Vectors, Array Declaration Syntax, Operating in Java, Arithmetic Operators, Basic Assignment Operators, Relational Operators, Boolean Logical Operators, Ternary Operator, Operator Precedence, Control Statements, Java's Selection Statements, Switch, Nested Switch, Iteration Constructs, Continue, Return.

Unit - II

Class an Introduction, What is a Class, What are Methods, Methods and Classes in Details, Methods Overloading, Constructor Overloading, Objects as Parameters, Returning objects, Recursion, Access Controll Visibility, Understanding Static, Final, Nested and Inner Classes, The String Class, Command Line Arguments, Inheritance, Inheritance Basic, Member Access and Inheritance, Super Class Variable and Sub Class Object, Using Super to Call Superclass Constructors, Another Use of Super, Multilevel hierarchy, Calling Constructor, Overriding Methods, Abstract Classes Method, Final and Inheritance, Object Class.

Unit - III

Interfaces and Packages, Defining Interface, What is a Package, Classpath Variable, access Protection, Important Packages, Exception Handling, Fundamentals of Exception Handling, Types of Exceptions, Uncaught Exceptions, Try and Catch Keywords, Throw, Throws and Finally, Nested Try Statements, Java Built in Exceptions, User Defined Exceptions.

Multithreaded Programming, The Java Thread Model, Priorities, Synchronization, Messaging, Thread Class and Runnable Interface, Creation of Threads, Creating Multiple Threads, Synchronization and Deadlock, Suspending, Resuming and Stopping Threads.

Unit - IV

Applets and Input Output, Input/Output Basics, Streams (Byte and Character), Reading From and writing to Console, Reading and Writing Files, Printwriter Class, Fundamentals Of Applets, Transient and Volatile Modifier, Strictfp, Native Methods, Problems with Native Methods, Handling Strings, String Length, Operations on Strings, Extract Character Methods, String Comparison Methods, Searching and Modifying, Data Conversion and Value of 0 Methods, Changing Case of Characters,

String Buffer, Exploring Java. Lang, Wrapper Classes and Simple Type Wrappers, Void, Abstract Process Class, Runtime Class and Memory Management, Other Programme Execution, System Class, Environment Properties, Using Clone 0 and Clonable 0 Interface, Class and Class loader, Math Class, Thread, Thread Group and Runnable Interface, Throwable Class, Security Manager, The java. lang. ref and java. lang. reflect packages, Java..Util

The Utility Classes, The Enumeration Interface, Vector, Stack, Dictionary, Hash table, Properties, Using Store 0 and Load 0, String Tokenizer, Bit set Class, Date and Date Comparison, Time Zones, Random Class, Observe.

Unit - V

Input Output Classes, File in Java, Directory, File Name Filter Interface, Creating Directory, The Stream Classes, Input Stream and Output Stream, File input Stream and File Output Stream, Byte Array Input Stream and Byte Array Output Stream, Filtered Byte Stream, Buffered ByteStream, Print Stream, Random Access File, Stream Tokenizer, Stream
. Benefits, **Networking,** Basic of Networking, Proxy Server, Domain Naming Services, Networking Classes and Interfaces, InetAddress Class, TCP/IP Sockets, Datagram Packet, Networth, **Applet Class,** Applet Basics, Applet Life Cycle, A Simple Banner Applet, Handling Events, getDocumentBaseO, getCodeBaseO, showDocumentBaseO, Audio Clip and Applet Stub interface.

BIT-IS: E-commerce

Unit I
Introduction of E-Commerce
Scope, Use, Advantage ofE-Commerce , Disadvantage ofE-commerce Limitations of E-Commerce, Why E-Commerce ?
E-Commerce & we , E-Commerce in India, E -Commerce in world Future Aspects of E-Commerce, Huge Market & E-Commerce Development in new Technologies, Bushiness with new vision Comparison of changing business, Is Change essential?

Unit II
Terms used in E-Commerce,
E shopping, E-cash, e-business, virtual marketing, e-market, e-customer Components of EDI (Electronics Data Interchange)
Concept relation management (CRM),
Modes of E-Commerce overview

U nit III
E-Commerce Cycle
Need & Requirement
Web sufferings, Selection of Element
Examine Information regarding Element Selection of Payment procedure Authentication & Validity checking Money Transfer
Confirmation, Delivery, Confirmation of Element Receiving

Unit IV
Internet a platform, Need for Internet in commerce
Language, software, Web site, Database, Technologies used, Web site Maintains,

Essentials of E-Commerce
Money Transaction, Various Electronics payment systems
Digital token, Smart card, Credit card, e-banking

Unit V
Risk Factor, Why People hastate.
Risk in electronics payment system, money transaction, Risk in E banking. Product Delivery,
Quality Factor, Product Durability.
E-commerce technologies, E- Commerce overview, Three tier Architecture

Technical steps & tools.