

SEMESTER V (B. Sc. IT)

0202026: INTERNET SECURITY

Full Marks: 100

Data Communication and Networking: A Prerequisite for Internet Security

Marks: 7

TCP Connection; TCP Open and TCP Half Opened; Understanding OSI Model at Glance; SSL Layer; TCP and UDP Header

Security Policy and Security Threats

Marks: 12

Need of Security; Security Goals; Purposes of a Security Policy; Forming Policy; Good Security Policy; Keeping the Policy Flexible; Threats and Vulnerabilities: Unauthorised LAN Access, Inappropriate Access to LAN Resources, Disclosure of Data, Unauthorised Modification of Data and Software, Disclosure of LAN Traffic, Spoofing of LAN Traffic, Disruption of LAN Functions

Classes of Attacks

Marks: 10

Introduction; Stealing Passwords; Social Engineering; Bugs and Backdoors; Authentication Failures; Protocol Failures; Information Leakage

Common Threats

Marks: 14

Introduction; Errors and Omissions; Fraud and Theft; Disgruntled Employees; Physical and Infrastructure; Malicious Hackers; Industrial Espionage; Malicious Code: Computer Viruses, Worms, Trojan Horses, Logic Bombs; Anti-Virus Technologies; Anti-Virus Policies and Considerations

Firewall and Proxy Servers

Marks: 14

Introduction; Firewall; Limitation; Kinds; Firewall Configuration; Disadvantages; Filtering Services and Reasonable Services to Filter; Digging for Worms; Packet Filtering; Specific Attacks: Packet Sniffing v/s Packet Spoofing; Implementing Policies (Default Allow, Default Deny) on Proxy

Identification and Authentication

Marks: 15

Introduction; I&A Based on Something that the User Knows: Passwords, Cryptographic Keys; I&A Based on Something the User Possesses: Memory Tokens, Smart Tokens; I&A Based on Something that the User Is; Implementing I&A Systems; Interdependencies; Cost Considerations; Authentication: One-Time Passwords, Kerberos, Choosing and Protecting Secret Tokens and Pins, Password Assurance, Confidentiality, Integrity, Authorisation

Cryptography

Marks: 16

Introduction to Basic Encryption and Decryption; Techniques used in Symmetric Key Cryptography: Caesar Cipher, Modified Version of Caesar Cipher, Mono-alphabetic Cipher, Homophonic Substitution Cipher, Polygram Substitution Cipher, Poly-alphabetic Substitution Cipher; Problem of Key Distribution in Symmetric Key Cryptography; Public key and Private Key; Hash (Message Digest): Signing the Digest; Digital Signatures; Symmetric- Key Cryptography; Asymmetric Key Cryptography; Pretty Good Privacy

Internet Security Ethics

Marks: 12

Introduction; Network Attacks; Issues Involved in Internet Ethics; ACM Code of Ethics and Professional Conduct; Using Web for Data Collection

Reference Books:

1. Schweitzer, D., 2002. Internet Security Made Easy: A Plain-English Guide to Protecting Yourself and Your Company Online, AMACOM Div American Mgmt Assn.
2. Shelly, G. B., Vermaat, M. E. and Quasney, J. J., 2009. Discovering Computers 2010: Living in a Digital World, Introductory, Cengage Learning.
3. Stallings, and William, S., 2006. Cryptography and Network Security, 4/E, Pearson Education India.
4. Stamatellos, G., 2007. Computer Ethics: A Global Perspective, Jones & Bartlett Learning.
5. Vacca, J. R., 2007. Practical Internet Security, Springer.
6. William, S., 2008. Computer Security: Principles and Practice, Pearson Education India.

0202178: VISUAL BASIC 6

Full Marks: 100

Introduction to Visual Basic

Marks: 10

Introduction to Graphical User Interface (GUI); Programming Language; The Visual Basic Environment; Microsoft Visual Basic Tool; Common Controls and their Properties; Visual Basic and Programming Terms; The Drop Down Menu: File, Edit, Project, Short Cut Keys, Short Cut, Events

Introduction to Database Programming

Marks: 10

Introduction; Section I: The Data Control; Other Properties; Book Marking; More Data Bound Controls; Section II: SQL; ORDERBY; INNER JOIN; DISTINCT; Section III: Using Data Access Objects

Essentials of Writing Code

Marks: 18

Introduction; Comments; If –Then loop; Do Loops (Do-Until and Do-While); With – End With loops; Select Case; Variables and Datatypes: Variable Type, User Defined Data Types; The Message Box; Input Box; Error Handling and Data Validation: Error Handling, Data Validation; Key Words; Drop Down Menu; Some Routines: Centering a Form, Highlighting Text, Waiting a Second, Preventing Multiple Copies

In Depth Visual Basic Coding

Marks: 14

Introduction; Section I: More Controls: Check Box, Option Box, Masked Edit Box, Common Dialog; Section II Coding Issues: Arrays, Sub Routines and Functions; API(Applications Programming Interface); More Effective Programming: Optimising for Speed, Reading a Flat File, Some Simple Graphics; Debugging; Planning; Testing

Object Orientation

Marks: 12

Introduction; Classes; Simulated Inheritance; Function Based Object Oriented Design for Visual Basic; Details of Visual Basic Programming; Collections; Destroying Objects; Object Browser; Pointers in VB; UML

Printing in VB

Marks: 12

Application distribution; Printing: Print Form, Printer; Crystal Reports; Communications in Visual Basic; Encryption; Advanced Encryption Concepts; Using Office Object Models to Write Integrated Applications

Active Data Objects

Marks: 11

ADO Basics; Methods; Code; Code Module; Class; Data Control; What is a DLL?

Active X Controls

Marks: 13

Introduction; ActiveX Documents; Code Components; In-Process Vs. Out-of-Process Components; Which ActiveX Component are used to Build?; TCP/IP Communication; Creating Multimedia Applications; Creating a CD player

Reference Books:

1. Cole, E., 2011. *Visual Basic Bible*, John Wiley & Sons.
2. Deitel, 2004. *Programming Visual Basic 2005*, 3rd ed., Pearson Education India.
3. Dhamdhare, M. D., 2006. *Visual Basic 6*, 2nd ed., Tata McGraw-Hill Education.
4. Dhotre, A. I., 2008. *Visual Basic 2005a developer's*, Technical Publications.
5. Dhotre, A. I., 2008. *Visual Basic*, 3rd d., Technical Publications.
6. Dr. Joshi, C. R. & Tapasvi, S., 2005. *Visual Basic design Patterns: VB 6.0 and VB.Net*, Dreamtech Press.
7. Er. Sharma, V., Er. Varshney, M. & Sharma, S., 2010. *Professional Visual Basic 2008*, Laxmi Publications, Ltd.
8. Halder, S. & Aravind, A. A., 2010. *Visual Basic 2008 how to program*, Pearson Education India.

0202187: SQL 2

Full Marks: 100

SQL Databases

Marks: 8

Working with SQL Environment; Creating and Altering Tables; Enforcing Data Integrity; SQL Views; Database Security

Data Access and Modification

Marks: 10

Querying SQL Data; Modifying SQL Data; Using Predicates; Working with Functions and Value Expression

Overview of PL/SQL

Marks: 16

Introduction; PL/SQL Attributes; Transaction Management with PL/SQL: COMMIT Statement, ROLLBACK Statement, SAVEPOINT Statement, LOCK TABLE Statement; PL/SQL Collections: Declaring Collections, Referencing Collections, Collection Method

PL/SQL Enlarged

Marks: 14

Introducing Cursors and their Attributes: Implicit Cursors, Explicit Cursors; PL/SQL Packages with ORACLE; Defining Triggers: DML Triggers, DDL Triggers, Database Event Triggers

SQL Server

Marks: 12

Introduction; Defining a Database; Building a Relationship; Functions with Database: Creating Tables, Building a View, Creating Stored Procedure; XML Functions

Featuring .NET

Marks: 12

Introduction; .NET Framework; Common Language Runtime; Web Form; .NET IDE; Introduction to XML; Creating a WEB Application

Crystal Reports

Marks: 10

Introduction; Creating Reports; Using Parameters; Integrating Reports; Charting Data (Demographics)

System as a Whole

Marks: 18

Introduction; Data Normalisation: First Normal Form, Second Normal Form, Third Normal Form, Other Normalisation Forms; Database Creation: Preparing the Data Dictionary, The Data Dictionary Components, Data Flow Diagram, Symbols of Data Flow Diagram, Entity Relationship Diagram (ERD); Developing Web Forms; Developing Reports

Reference Books:

1. Day, J., 2004. Starting Out With Oracle (Covers Sql, Pl/Sql, Database, SQL, PL/SQL, Developers Tool and DBA), Dreamtech Press.
2. Dewson, R., 2006. Beginning SQL server 2005 for developers: from novice to Professional, Apress.
3. Donahoo, J. M. & Speegle, D. G., 2005. SQL: Practical Guide for Developers, Academic Press.
4. Dr. Deshpande, Ps., 2006. SQL & PL/SQL For Oracle 10G Black Book, 7th ed., Dreamtech Press.
5. Duthie, A. G. & MacDonald, M., 2003. ASP.NET in a nutshell, O'Reilly Media, Inc.

ELECTIVE 1 (Choose any one from elective)**0202027: MULTIMEDIA**

Full Marks: 100

Introduction to Multimedia

Marks: 10

Introduction; Elements of Multimedia System: Text, Graphics, Audio, Video, Animation; Features of Multimedia; Applications of Multimedia; Stages of Multimedia Application Development

Multimedia Hardware: Connecting Devices

Marks: 14

Introduction; Multimedia Hardware; Connecting Devices; Input Devices; Keyboards; Pointing Devices; High-Degree of Freedom Input Devices; Imaging and Video Input Devices: Flat-Bed Scanners, Audio Input Devices; Touch Screens; Output Devices: Audio Devices, Amplifiers and Speakers, Monitors, Video Device, Projectors, Printers; Storage Devices: Random Access Memory (RAM), Read-Only Memory (ROM), Floppy and Hard Disks, Zip, jaz, SyQuest, and Optical Storage Devices, Digital Versatile Disc (DVD), CD-ROM Players, CD Recorders, Videodisc Players; Communicating Devices; Modems; ISDN; Cable Modems

Text and Image

Marks: 12

Introduction; Multimedia Building Blocks; Text in Multimedia: Fonts and Faces, Selecting Text Fonts, Computers and Text, Character Set and Alphabets; Font Editing and Design Tools; Digital Image; Digital Image Format; Captured Image Format; Stored Image Format; Capturing and Editing Images; How Vector Drawing Works?

Audio and Video

Marks: 15

Introduction; Power of Sound; Multimedia Sound Systems; Digital Audio; Preparing Digital Audio Files; Editing Digital Recordings; Making MIDI Audio; Audio File Formats: Software used for Audio; Principles of Animation; Animation Techniques; Cel Animation; Computer Animation; Kinematics; Morphing; Animation File Formats; Video: Analog Versus Digital, Broadcast Video Standards, NTSC, PAL, SECAM, HDTV; Shooting and Editing Video; Video Tips; Recording Formats; Digital Video; Video Compression: MPEG, DVI/Indeo; Optimising Video Files for CD-ROM

Document, Hypertext and Hypermedia

Marks: 8

Introduction; Documents; SGML and Multimedia; Open Document Architecture (ODA); Hypertext; Hypermedia; Hypertext and Hypermedia; Hypertext, Hypermedia and Multimedia; Hypertext System; Multimedia System; Hypermedia System; Hypertext and the World Wide Web

Authoring Tools and Multimedia Workstation

Marks: 15

Authoring; Authoring Tools: Card Based Authoring Tool, Page Based Authoring Tool, Icon Based Authoring Tool, Time Based Authoring Tool, Object Oriented Authoring Tool; Multimedia System; Communication Architecture; Hybrid Systems; Integrated Device Control: Integrated Transmission Control, Integrated Transmission; Digital Systems; Multimedia Workstation: Bus, Multimedia Devices, Primary Storage, Secondary Storage, Processor, Operating System; Preference of Operating System for Workstation: The Macintosh Platform, The Windows Platform, Networking Macintosh and Windows Computers

Basic Tools for Multimedia Objects

Marks: 14

Introduction; Text Editing and Word Processing Tools; OCR Software; Image-Editing Tools; Painting and Drawing Tools; Sound Editing Tools; Animation, Video and Digital Movie Tools: Video Formats, Common Organisation of Video Formats, QuickTime; Linking Multimedia Objects: OLE, DDE, NetDDE

Multimedia Operating System

Marks: 12

Introduction; Multimedia Operating System; Real Time Process: Characteristics of Real Time Systems, Real Time and Multimedia, Resource Management, Resources, Requirements, Components of the Resources, Phases of the Resource Reservation and Management Process, Resource Allocation Scheme

Reference Books:

1. Bender, M., 2009. *Multimedia: Network Infrastructure Configuration*, Cengage Learning.
2. Bruzzese, P. J., Barrett, R. and Dipchan, W., 2010. *Multimedia*, Pearson Education India.
3. Ciampa, M., 2008. *Security+ Guide to Multimedia Fundamentals*, Cengage Learning.
4. Davies, J. *Understanding Multimedia*, 2nd ed., O'Reilly Media, Inc.
5. Gibson, D., 2010. *Multimedia, Enterprise Administration*, Cengage Learning.
6. Kelley, J. Campagna, R. and Wessels, D., 2009. *Multimedia Network Access Control for Dummies*, John Wiley & Sons.
7. Solomon, G. M., 2010. *Multimedia application*, Jones & Bartlett Publishers.

0202157: EMBEDDED SYSTEMS AND PROGRAMMING

Full Marks: 100

Embedded Systems Overview

Marks: 10

Introduction; Design Challenge – Optimising Design Metrics; Embedded Processor Technology: General-Purpose Processors – Software, Single-Purpose Processors – Hardware, Application-Specific Processors; IC Technology: Full-Custom/VLSI, Semi-Custom ASIC (gate array and standard cell), PLD; Design Technology: Compilation/Synthesis, Libraries/IP, Test/Verification, Other Productivity Improvers

Overview of Microcontrollers

Marks: 15

Introduction; Embedded Controller; Microcontrollers and Microprocessors: Central Processing Unit (CPU) 20, Fetching and Executing an Instruction, The Buses: Address, Data, and Control, Control/Monitor (Input/output) Devices; Types of Microcontrollers: The 8,16 and 32-Bit Microcontrollers; Embedded and External Memory Microcontrollers: Embedded Microcontrollers, External Memory Microcontrollers; Microcontroller Architectural Features: Von-Neumann Architecture, Harvard Architecture, CISC (Complex Instruction Set Computer) Architecture Microcontrollers, RISC (Reduced Instruction Set Computer) Architecture Microcontrollers, SISC (Specific Instruction Set Computer); Microcontroller Applications; Commercial Microcontroller Devices

Embedded System Hardware

Marks: 12

Introduction; Input: Sensors, Sample-and-Hold Circuits, A/D-Converters; Communication: Requirements, Guaranteeing Real-time Behaviour; Processing Units: Application-Specific Circuits (ASICs), Processors; Output: Displays, Electro-mechanical Devices, Actuators

Devices and Buses

Marks: 11

Introduction; I/O Ports- Serial and Parallel Ports: Types of Serial Ports, Types of Parallel Ports; Modes of Communication: Protocols; Timing and Counting Devices: Timer, Counter; Serial Bus Communication Protocols: I2C, CAN

Programming Concepts and Embedded Programming in C, C++

Marks: 18

Introduction; Software Programming in Assembly Language (ALP) and in High Level Language C: Assembly Language Programming, High Level Language; C, Program Elements: Header and Source Files and Pre-processor Directives: Include Directive for the Inclusion of Files, Source Files, Pre-processor Directives; Program Elements: Macros, Functions, Use of Data Types, Use of Data Structures, Queue, Stack, Array (One Dimensional Vector), Tree, Use of Modifiers, Use of Conditions, Loops and Infinite Loops, Use of Pointers, NULL Pointer, Use of Function Calls; Embedded Programming In C++: Objected Oriented Programming, Embedded Programming in C+ +

Standard Software: Embedded Operating Systems, Middleware, and Scheduling

Marks: 12

Introduction; Prediction of Execution Times; Scheduling in Real-Time Systems: Classification of Scheduling Algorithms, Aperiodic Scheduling, Scheduling with Precedence Constraints, Periodic Scheduling, Resource Access Protocols

Basic Concepts of Real Time Operating Systems

Marks: 13

Introduction; Characteristics of Real-Time Tasks; Real-Time Scheduling; Operating System Designs; Library-Based RTOS (“Kernel-Less” Approach): Monolithic Kernels, Microkernels, Virtual Machines and Exokernels; RTOS for Safety Critical Systems; Protection in Time Domain; Protection in Space Domain; Secure Operating System Architecture

Validation

Marks: 9

Introduction; Simulation; Rapid Prototyping and Emulation; Test; Fault Simulation; Fault Injection; Risk and Dependability Analysis; Formal Verifications

Reference Books:

1. Baron, J., Geffroy, J. C. & Motet, G., 1997. *Embedded System Applications*, 1st ed., Springer.
2. Barr, M. & Massa, A., 2006. *Programming Embedded Systems: With C and GNU Development Tools*, 2nd ed., O'Reilly Media.
3. Barr, M., 1999. *Programming Embedded Systems in C and C ++*, 1st ed., O'Reilly Media.
4. Catsoulis, J., 2005. *Designing Embedded Hardware*, 2nd ed., O'Reilly Media.
5. Crisp, J., 2004. *Introduction to Microprocessors and Microcontrollers*, 1st ed., Newnes.
6. Ganssle, J., Noergaard, T. & Eady, F., et al. 2007. *Embedded Hardware: Know It All*, Newnes.
7. Kopetz, H., 2011. *Real-Time Systems: Design Principles for Distributed Embedded Applications* (Real-Time Systems Series), 2nd ed., Springer.

0202156: ADVANCED JAVA

Full Marks: 100

Advanced Java

Marks: 15

Introduction to Basic Java; Advanced Java; Object-Oriented Design Using Java: Classes vs. Interfaces, Data Members, Methods, Constructors, Creating and Initialising an Object, Inheritance, Code Reuse; OOP -Strong, Efficient, and Effective; Java I/O Routines; Streams; The Java Core System; The System Class: Input Using the System Class, Output Using the System Class; Files: The Basics, Taking Files One Step Further; The Abstract Window Toolkit and Swing Classes: Input Alternatives, Output Alternatives, I/O in Short; Thread Basics; Why Use Threads?: More responsive UI, Take Advantage of Multiprocessor Systems, Simplicity of Modelling, Asynchronous or Background Processing, Simple But Sometimes Risky, Don't Overdo It; Creating Threads: Ending Threads, Joining With Threads, Scheduling, Sleeping, Daemon Threads, Who Creates Threads?; AWT and Swing; Using Timer Task; Servlets and Java Server Pages Technology; Implementing an RMI Object; All Threads Live in the Same Memory Space; Synchronisation for Controlled Access; Ensuring Visibility of Changes to Shared Data; Atomic Code Blocks Protected by Locks; Java Locking: Synchronised Methods, Synchronised Blocks, Most Classes are Not Synchronised

Introduction to Swing

Marks: 10

Introduction to UIs; Swing's Role; MVC; JComponent; Simple Swing Widgets: JLabel, JButton, JTextField, JFrame, A Simple Application; Additional Swing Widgets: JComboBox, JTabbedPane, JPasswordField, JCheckBox/JRadioButton, JMenu/JMenuItem/JMenuBar, JSlider, JSpinner, JToolBar, JToolTip, JOptionPane, JTextArea, JScrollPane, JList, JTable, JTree; Swing Concepts: Easy Layouts, GridBagLayout, Events, Models, Model Examples; Application

Database and SQL Fundamentals

Marks: 14

Introduction; What is a Database?; Data vs Information; Data Base Concepts; Benefits of the Database Approach; Data Retrieval on the Basis of Selection Criteria; Why have Databases (and a DBMS)?; DBMS Standardisation; Data Base Project Development: Analysis, Design, Development, Implementation, Maintenance; Conceptual Data Modelling; Types of Relationship Between Data Item: One to One Association, One to Many Association, Many to Many Association; Codd's Rules, Structured Query Language, Using SQL as a Data Definition Language, The CREATE DATABASE

DatabaseName, Using SQL as a Dataquery Language, The Where Clause; Union; Simple Joins; Parent/Children Relationships; Query Processing Rules with HAVING; ODBC and JDBC drivers: Microsoft's ODBC, JDBC

JDBC Fundamentals

Marks: 10

Introduction; Model; Drivers; Connecting to an ODBC Data Source; JDBC Connection: Working With the Driver Manager, Loading Drivers, Preloading from Program; JDBC Implementation: Using the Connection Class, DBC URL, Managing SQL Transactions, Using the Statement, Statement, Complete Program, Driver Manager, Get connection, Create Statement, Execute Update, Selecting Rows; Result set Processing: Retrieving Results: Deleting a Record, Inserting a Record, Updating Records, Deleting a Table; Prepared Statement; Callable Statement

Servlets

Marks: 16

Introduction of Java Servlets; Servlet Process Flow; The Java Servlet API; The Servlet Life Cycle: Understanding the Life-Cycle, Servlet Initialisation: Init Method, Servlet Request Handling; Basic Servlet Examples: Simple HTTP Servlet, Basic Servlet Structure, What the Service Method Does?, How the Servlet Gets Invoked, Running the Servlet; HTML form Generator Servlet: Response Object, Invoking the Servlet, Servlet Output; HTML Form Processing Servlet: Getting Form Values, General Request Properties; Simple Counter Servlet: Persistence, Multi-Threaded; Servlet Initialisation Parameters: ServletConfig object, What this Servlet does?, Servlet Configuration File, Understanding the Configuration File Format; HTTP Request Handling Utility Servlet; Additional Servlet Examples: Cookie Servlet; URL Rewriting Servlet; A Real Persistent Servlet Between Servlet Life-Cycle; User Sessions; User Session Counter Servlet; JDBC Servlet; Servlet Tag with SHTML; Servlet Interaction Techniques

JSP

Marks: 11

Introduction; How Java Server Pages Work?; Components of Java Server Pages: JSP Directives, Declarations, Scriptlets, Comments, Expressions; WebSphere Extensions to JSP Scripting; Accessing Implicit Objects; JSP Interactions; Invoking a JSP by URL; Calling a servlet from a JSP; Calling a JSP from a Servlet; Invoking a JSP from a JSP; Creating Dynamic Content in JSPs; Standard JSP Tags; WebSphere-specific tags; Differences Between Java Server Page specification .91 and 1.0

Java Beans

Marks: 12

Introduction to Software Components: Need, Classifications; Software Component Model: Features of Software Component; Javabeans: Importance of Java Component Model, JavaBeans Objectives, Basic Bean Concepts; Bean Development Kit: Starting the BeanBox, Using the BDK BeanBox and the Demo JavaBeans; Building the First Bean: How the Program Works?; Event Handling: Registering Event Listeners, Naming Event Listeners, Following the ActionEvent, Dispatching Events to Event Listeners; Bean Persistence: Serialisation and Deserialisation, Serialisable Bean, Listing Graph.java, Listing Node.java

Hibernate and Struts

Marks: 12

Introduction to Hibernate; Architecture; Communication with RDBMS; What Does Hibernate Offer?; Using Hibernate; Pros and Cons; JDBC Vs Hibernate: Relational Persistence for JAVA, Transparent Persistence, Support for Query Language, Database Dependent Code, Maintenance Cost, Optimise Performance, Automatic Versioning and Time Stamping; Disadvantages of Hibernate; The Model-View-Controller Architecture; What is Struts?; Struts Tags: Common Attributes, Referencing Properties, Creating Beans, Other Bean Tags, Creating HTML Forms; Generics; Generic Type-safety; Naming Conventions; Writing Generic Classes; Generics and Substitutability; Generic Methods

Reference Books:

1. Brunner, J. R., 2003. *Jsp: Practical Guide for Java Programmers*, Elsevier Publication.
2. Buyya, 2009. *Object Oriented Prog With Java*, Tata McGraw-Hill Education Publication.

3. Callaway, *Inside Servlets*, Pearson Education India Publication.
4. Elliott, J., 2008. *Getting Started with Hibernate 3*, O'Reilly Media, Inc. Publication.
5. Farley, J., Crawford, W., Malani, P., Norman, J. & Gehtland, J., 2005. *Java Enterprise in a Nutshell*, 3rd ed. O'Reilly Media, Inc. Publication.
6. Haecke, V. B., 2002. *Jdbc 3.0: Java Database Connectivity*, John Wiley & Sons Publication.
7. Hall, 2008. *Core Servlets And Javasever Pages, Vol 2: Advanced Technologies, 2/E*, Pearson Education India Publication.

ELECTIVE 2 (Choose any one from elective)

0202024: ENTERPRISE RESOURCE PLANNING

Full Marks: 100

Introduction to Enterprise Resource Planning (ERP)

Marks: 7

Introduction; History and Evolution; Meaning; Definition; Concept; Implementation of an ERP System; Advantages; Disadvantages; Applicability; Reasons for the Growth of the ERP Market; Success of the ERP

Enterprise—An Overview

Marks: 7

Introduction; The Integration of Management Information System; Modelling Business with Information Systems; The Integrated Data Model (IDM); Objectives and Types

ERP and Related Technologies

Marks: 10

Introduction; Business Process Reengineering: Steps Involved; Data Warehousing: features; Data Mining; Online Analytical Processing (OLAP); Supply Chain Management; Product Life Cycle Management (LCM); Geographic Information System (GIS); Customer Relationship Management

ERP — A Manufacturing Perspective

Marks: 15

Introduction; Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM): Uses of CAD and CAM; Material Requirement Planning (MRP): Master Production Schedule, Bill of Materials Closed Loop MRP; Manufacturing Resource Planning-II (MRP-II); Distribution Requirement Planning (DRP); JIT and Kanban System: Elimination of Waste, Quality Management, Total Employee Involvement, Kanban, Benefits of JIT, Pitfalls of JIT; Product Data Management (PDM): Classification of Components, Classification of Documents, Product Structure, Querying the Data, Benefits of PDM; Process Management; Work Management; Workflow Management; Work History Management; Make-To-Order (MTO) and Make-To-Stock (MTS); Assemble-To-Order (ATO); Engineer-To-Order (ETO); Configure-To-Order (CTO)

ERP Modules

Marks: 11

Introduction; Finance Modules; Sales and Distribution Modules; Manufacturing Modules; Human Resources Modules: Personnel Management, Organisational Management, Payroll Accounting, Time Management; Plant Maintenance Modules; Quality Management Modules: Computer Integrated Quality Management (CIQ); Materials Management

Advantages and Disadvantages of ERP

Marks: 10

Introduction; Reduction of Lead-time; On-time Shipment; Reduction in Time Cycle; Improved Resource Utilisation; Better Customer Satisfaction; Increased Flexibility; Reduced Quality Cost; Improved Information Accuracy and Decision Making Capability; Disadvantages

ERP Market

Marks: 14

Introduction; SAP AG: Company Profile, Products and Technology; R/3 – Overview: The R/3 System, Best Business Practices and New Technologies, R/3 Application Modules, R/3 Modules, R/3-Open for Customised Strategic Information Management, Distributed Applications, R/3 and the Internet; SAP's Business Engineer; SAP Advantage; BAAN Company: Company Profile, Technology and Products, Serving Vertical Industries, BaanERP Modules, BaanERP Tools, Software Development and Administration Tools; Oracle Corporation: Vertical Solutions; PeopleSoft Incorporation: Company Profile, Management Solutions, Commercial Solutions, Industry Solutions, People Tools, Technology, Partnerships, PeopleSoft Implementation Toolkit; System Software Associates, Inc. (SSA): Company Profile, BPCS Client/Server; QAD: Company Profile, Products

ERP Implementation Cycle

Marks: 10

Introduction; Pre-evaluation Screening; Package Evaluation; Project Planning Phase; Gap Analysis; Re-engineering; Configuration; Implementation Team Training; Testing; Going Live; End-user Training; Post-implementation (Maintenance Mode)

Vendors, Consultants and Users

Marks: 7

Introduction; In-house Implementation – Pros and Cons; Vendors: Role of the Vendor; Consultants: Role of Consultants; End-Users

Future Directions in ERP

Marks: 9

Introduction; New Markets; New Channels; Faster Implementation Methodologies; Business Model and Business Application Programming Interfaces (BAPI's); Convergence on Windows NT; Application Platforms; New Business Segments; More Features; Web Enabling; Market Snapshot

Reference Books:

1. Altekar, R.V., 2006. *Enterprisewide Resource Planning: Theory And Practice*, ERP Market, PHI Learning Pvt. Ltd.
2. Christopher P.H., and Light, B., 1999, *A Critical Success Factors Model for ERP Implementation*, IEEE Software.
3. Codd, E.F., 1972. *Relational Completeness of Data Base Sublanguages Data Base Systems*. In: Rustin R. Eds.- New York; Prentice Hall, (Courant Computer Sci. Symposia Series No.6).
4. Davis, H.C., Knight, S., Hall, W., 1994. *Light Hypermedia Link Services: A Study of Third Party Application Integration*. ECHT.
5. *E trade services, ERP modules*. Available at: <<http://www.etradeservices.com/erp-module/>> [Accessed 8 December 2010].

0202025: GEOGRAPHIC INFORMATION SYSTEM

Full Marks: 100

Geographic Information System

Marks: 8

Geographic Information Systems; Components; How a GIS Works; GIS tasks; GIS for a Better World; Functions of a Geographic Information System; The Importance

GIS Operations

Marks: 14

Introduction; List of Key GIS Operations; Project Set-up; Data Entry; Data Conversion; Data Validation; Data Visualisation; Map Database Management; Demystifying the Conversion of Data into Information; Overview

Fundamentals of Remote Sensing

Marks: 15

Concept of Remote Sensing; Characteristics of Electro-Magnetic Radiation; Types of Remote Sensing with Respect to Wavelength Regions; Definition of Radiometry; Spectral Reflectance of Land Covers; Transmittance of the Atmosphere; Radiative Transfer Equation

Remote Sensing and GIS

Marks: 14

GIS in Remote Sensing; Function of GIS; Model and Data Structure; Data Input and Editing; Spatial Query; Spatial Analysis; Use of Remote Sensing Data in GIS; Errors and Fuzziness of Geographic Data and their Influences on GIS Products

GIS Analysis and Modelling

Marks: 12

GIS Analysis and Modelling; Types of Geographic Data; Developments in GIS Analysis; GIS Modelling; Advances in the Data Supply; Advances in GIS Representation; Uncertainty of GIS Data

GIS Organisation and Management

Marks: 15

Developing GIS Management Strategies for an Organisation; GIS Organisational Models; Establishing a GIS Model for an Organisation; The GIS Implementation Process; Coordinating GIS Participants and Users; Management and Control of GIS; Integrating GIS into an Organisation's Operations

GIS Application

Marks: 12

Applications of GIS; Remote Sensing Technology; Satellites & Sensors; Geographical Information Systems Application; Uses of Coastal GIS Packages; Application of Remote Sensing and GIS in Coastal Ecosystem Management

Internet GIS

Marks: 10

Introduction; Web GIS Technology; Web GIS Architectures; Web GIS Development Cycle; Web GIS Use and Maintenance

Reference Books:

1. Burrough, P.A. and McDonnell, R.A., 1998. *Principles of Geographical Information Systems*. London: Oxford.
2. Campbell, H. J., 1991. "Organizational Issues in Managing Geographic Information". In: *Handling Geographical Information: Methodology and Potential Applications*, John Wiley & Sons inc.

3. Campbell, H. J.,1993. "GIS Implementation in British Local Government".Kluwer Academic Publishers, Dordrecht - The Netherlands.
4. Dent, B.D., 1999. *Cartography. Thematic Map Design*, 5 th ed, Brown Publishers

0202085: MANAGEMENT INFORMATION SYSTEMS (MIS)

Full Marks: 100

Introduction to Management Information System

Marks: 9

Introduction; Importance of Information; Role of Information in Management; MIS and its Definition; Systems Concept; Characteristics of Useful Information; Information System Process; Computer Based Information Systems; Aims of Studying MIS; MIS and Operational Information; Management Information System and Academics; MIS and the User

MIS and Information Technology

Marks: 14

Introduction; Characteristics of IT Impacting Industries: Powerful Information Processing, Convenient Data Storage and Retrieval, Better Communication, Rich Multimedia, Digital Representation, Versatile Input/ Output Capabilities; Data Processing; Transaction Processing; Application Process; Information System Processing; Impact of the Management Information System; Management Information System and Computer

Nature of Management Information

Marks: 15

Introduction; Levels of Management Focus; Levels of Organisational Groups; Nature of Collaboration; Objectives of Management Tasks; Information Flow Direction and Source; Managerial Tasks and Functions; Content and Presentation of Information: Summaries from Routine Operations, Information on Exceptional Events, Ad hoc Information, Time Series Information, Comparative External Information, Contextual or Environmental Information; How Information Supply is Initiated?

Importance of Software and Hardware in MIS

Marks: 13

Introduction; Computer Hardware Basics: Importance of Computers, Essential Features, Components, Types of Computer Systems; Computer Software Basics; Importance of Software Application in Management: Programming Language, Types of Software

Communication and Computer Networks in MIS

Marks: 11

Introduction; Development of Telecommunication; Elements of Communication Systems; Computer Network: Local Area Network, Wide Area Network, Difference between LAN and WAN, Network Topology; The Internet

Support Models and Knowledge Management

Marks: 11

Introduction; Transaction Processing Systems; Online Analytical Processing (OLAP); Decision Support System (DSS); Executive Information System (EIS); Groupware: Group Decision Support System; Barcode System: Barcode Applications

Business Process and Design Development Processes

Marks: 12

Introduction; The Basic Business Processes: Basic Business Decision Making, Buying and Selling Activities, Conversion, Support Functions; Systems Concept: Control of Systems, System Performance Standards, Systems Approach

Introduction; A Model for thinking about Ethical, Social and Political Issues; Five Moral Dimensions of The Information Age; Key Technology Trends that Raise Ethical Issues; Acceptable Behavior on the Networks: New Standards of Conduct: Netiquette, Acceptable Use Policies, Exporting Through the Networks, Copyrights

Reference Books:

1. Bob Ritchie, David Marshall and Alan Eardley, 1998. *Information System in Business*, London, International Thomson Business Press.
2. Curt White, 2010, *Data Communication and Computer Networks*, Course Technology, 6th edition.
3. David L. Olson, 1999. *Decision Support Models and Expert System*, Dame Publication.
4. David Murray, 2007, *Introduction to MIS*, Kendall Hunt Publication Co.
5. James A. Senn, 1989. *Analysis and Design of Information Systems*, McGraw-Hill Publishing Company, Singapore, 2nd edition.
6. James A. Senn, 1989. *Analysis and Design of Information Systems*, Singapore, McGraw-Hill Publishing Company, 2nd edition.