

SEMESTER III (Information Technology)

0203136: RESEARCH METHODOLOGY

Full Marks: 100

Research Methodology - An Introduction

Marks: 10

Introduction: definition, objectives, motives, characteristics, limitations; Types of Research; Research Approaches; Research Approaches and Significance of Research: Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical; Research Methods versus Methodology; Research and Scientific Method; Research Process; Criteria of Good Research; Problems Encountered by Researchers in India

Research Problem

Marks: 8

Defining: What is a Research Problem?, Selecting a Problem, Necessity of Defining a Problem, Technique Involved in Defining a Problem; Research Design: Meaning, need, features, important concepts related to it; Different Research Designs; Basic Principles of Experimental Designs

Sampling Fundamentals and Sampling Design

Marks: 12

Introduction: Need for Sampling, Definition, Important Sampling Distributions, Essentials of Good Samples, Central Limit Theorem; Methods of Sampling: random, non-random; Sampling Theory: Sandler's A Test, Concept of Standard Error; Sample Size and its Discrimination: Nature of Universe; Sampling Design: Census and Sample Survey, implications of sample design, steps, criteria, characteristics of a good sample design; Different Types of Sample Designs: Non-Probability, Probability, Determination of Appropriate

Measurement and Scaling Techniques

Marks: 12

Introduction: Measurement in Research, Meaning of Attitude; Measurement Scales: Selection of Measurement of Scale, Measurement of Scales; Sources of Error in Measurement: Respondent, Situation, Measurer, Instrument; Tests of Sound Measurement: Test of Validity, Test of Reliability, Test of Practicality, Technique of Developing Measurement Tools; Scaling: meaning, classification bases, Important Scaling Techniques; Scale Construction Techniques: Arbitrary Scales, Differential Scales (or Thurstone-type Scales), Summated Scales (or Likert-type Scales); Multidimensional Scaling

Methods of Data Collection

Marks: 16

Introduction; Meaning and Need for Data: Source of Data, Primary and Secondary Data, Methods and Techniques of Data Collection, of Primary Data, Observation Method, Interview Method; Collection of Data through Questionnaires: Merits and Demerits, Main Aspects, Essentials of a Good Questionnaire, Functions, Problem of Response Questionnaires, Pilot testing or Pre-testing, Specimen; Collection of Data through Schedules: Purpose of Schedule, Essentials of a Good Schedule, Difference between Questionnaires and Schedules; Collection of Data through Interview: purpose, kinds, technique; Collection of Data through Observation: Kinds of Observation, of Observation in Social Research, Limitations of Observation as a Method of Social Research; Modern Methods of Data Collection; Other Methods of Data Collection; Collection of Secondary Data: reliability, suitability, adequacy; Selection of Appropriate Method for Data Collection; Case Study Method; Guidelines for Constructing Questionnaire/Schedule; Choice of Suitable Method

Processing and Analysing of Data

Marks: 12

Introduction: Processing Operations, Some Problems in Processing, Elements/Types of Analysis, Statistics in Research; Data Measuring: Measures of Central Tendency, Measures of Dispersion, Measures of Relationship; Regression Analysis:

Simple Regression Analysis, Multiple Correlation and Regression, Partial Correlation; Other Measures: Index Numbers, Time Series Analysis

Interpretation and Report Writing

Marks: 12

Introduction; Meaning of Interpretation: essentials, technique, precautions; Report Writing: purpose, meaning, Importance of Social Research Report, Significance, Different Steps in Writing Report, Layout of the Research Report; Types of Reports; Mechanics of Writing A Research Report; Characteristics of a Good Research Report; Precautions for Writing Research Reports; Presentation of Research Report; Evaluation of the Research Report

Computer – Its Role in Research

Marks: 11

Introduction; Significance: Evolution, Computer System, Important Characteristics; Introduction to Binary Number System: Computations in Binary System, Binary Fractions; Computer Applications; Computers in Research: Phases of Research Process, Further Uses of Computers; Use of Internet in Research; Importance of Internet

Reference Books:

1. Dane, C. F., 2010. Evaluating Research: Methodology for People Who Need to Read Research. Sage Publications.
2. Geoffrey. R. and David. M., 2005. Essentials of Research Design and Methodology. Wiley Publishing.
3. Goddard , W., and Melville, S., 2004. Research Methodology:, An Introduction. Juta and Company Ltd.
4. Jonker, J, and Pennink S., 2009. The Essence of Research Methodology: A Concise Guide for Master and PhD Students in Management Science., Springer Publication.
5. Khan., Research Methodology. APH Publishing.
6. Khanzode, V.V., 2004. Research Methodology., APH Publishing.

0203226: LEGAL ASPECTS OF BUSINESS

Full marks: 100

Indian Contract Act, 1872

Marks: 8

Introduction to Law; Contract and ‘Contract Act’; Nature of Law of Contracts: Proposal, Acceptance, Consideration, Void Agreement, Wagering Agreement, Minor’s Agreement; Essentials of Contract: Competent Parties, Free Consent, Lawful Consideration and Lawful Object, Not a Void Agreement; Discharge of Contracts; Legal Remedies for Breach of Contracts

Special Contracts

Marks: 10

Quasi Contracts: Types, Difference between Contracts and Quasi Contracts; Contract of Indemnity (Sec. 124): Parties to Indemnity Contract, Essentials of Contract of Indemnity, Rights of Indemnity Holder When Sued; Contract of Guarantee (Sec 126): Essentials of a Contract of Guarantee, Difference between Indemnity and Guarantee, Kinds of Guarantee, Rights of Surety, Rights of a Creditor Against Surety, Discharge of Surety; Bailment Contract: Duties of Bailor, Duties of Bailee; Rights of the Bailor: Rights of the Bailee, Rights of Bailor and Bailee against Wrongdoers, Types of Lien, of Lost Goods, Termination of Bailment; Contract of Pledge: Advantages of Pledge, Difference between Pledge and Bailment, and Duties of Pawnee, Rights and Duties of Pawnor, Pledge by Non-owners

Sales of Goods Act, 1930

Marks: 12

Introduction: Salient Features, Essentials of a Contract of Sale, Sale and Agreement to Sell, Sale and Hire-Purchase Agreement, Sale and Bailment, Sale and Barter Exchange; Formalities of a Contract of Sale: Goods, Effects of Destruction of Goods, Ascertainment of Price; Conditions and Warranties: Definition of Condition, Definition of Warranty, Distinction between Condition and Warranty; CAVEAT Emptor; Transfer of Property: Passing of Property from Seller to Buyer, Passing of Property in the Contract for Sale of Unascertained Goods [Section 23], Passing of the Property in Goods sent on Approval or 'On Sale or Return, Reservation of Right of Disposal, Passing of Risk [Section 26]; Provisions related to Performance of Contract of Sale: Rights of Unpaid Seller, 2 Auction Sale, Rules Regarding Delivery of Goods

Negotiable Instruments Act, 1881

Marks: 15

Introduction; Negotiable Instrument: Meaning, Characteristics, Types, Presumptions as to Negotiable Instrument, Distinction between Bill of Exchange and Promissory Note, Distinction between Bills of Exchange and Cheque; Parties to a Negotiable Instrument; Liability of the Parties to Negotiable Instruments: Parties to Bill of Exchange, Parties to a Promissory Note, Parties to a Cheque, Capacities of Parties to the Negotiable Instruments; Liability of the Parties to Negotiable Instruments: Liability of the Drawer (Section 30), Liability of Drawee Cheque, Liability of Endorser [Section 35], Liability of Parties to Holder in Due Course, Provisions of Section 37,38 and 39 Regarding Liability, Other Important Provisions of the Negotiable Instrument Act; Holder and Holder in Due Course: Holder, Holder in Due Course, Rights and Privileges of a Holder in Due Course, Distinction between Holder and Holder in Due Course; Negotiation and Types of Endorsement: Procedure of Transfer or Modes of negotiation, of Endorsement, The Duration of Negotiability; Dishonour of Negotiable Instrument: Dishonour by Non-acceptance (Section 91), Dishonour by Non-Payment (Section 92); Noting and Protesting: Noting, Protest, Distinction between Noting and Protest, Provision of the Act relating to "Reasonable Time"

The Companies Act, 1956

Marks: 12

Introduction: Characteristic Features of a Company; Important Types: Classification of Companies on The Basis of Liability, on The Basis of Mode of Incorporation, Based on The Basis of Ownership, Based on The Jurisdiction of Functioning, on the basis of Control and/or Share Holding, other types; Prohibition of Associations and Partnerships Exceeding Certain Number; Incorporation of a Company: Important Stages involved in the Process of Formation of a Company, Procedure of Registration of a Company; Memorandum of Association And Article of Association: Definition of Memorandum of Association, Definition of Article of Association, Between Memorandum And Articles; Prospectus: Statement in Lieu of Prospectus, Distinction between a Prospectus and a Statement in Lieu of Prospectus; Share Capital: Classification of Share Capital, Share and Types of Share Capital, Provisions Relating to "Certificate of Shares", Alteration of Share Capital, Increase in Share Capital, Reduction of Share Capital

The Consumer Protection Act, 1986

Marks: 16

Introduction; Need and objectives; Extent, Commencement and Application of the Act: Amendments made in the Act in 1991, Amendments Made in the Act in 1993, Amendments of 2002; Definitions: Appropriate Laboratory [Sec2 (1) (a)], Branch Office [Sec2 (1) (aa)], Consumer [Sec2 (1) (d)], A Person [Sec2 (1) (m)], Goods [Sec2 (1) (i)], Service [Sec2 (1) (O)], Spurious Goods and Services [Sec2 (1) (OO)], Trader [Sec2 (1) (q)], Manufacturer [Sec2 (1) (j)], Consumer Dispute [Sec2(1) (e)], Complaint [Sec2 (1) (c) and Complainant [Sec2 (1) (b)], Trade Practice [Sec2 (1) (nn)], Trade Practice [Sec2 (1) (r)], Defect [Sec2(1) (f)], Deficiency [Sec2 (1) (g)], Members [Sec2(1) (jj)]; Six Rights in Consumer Protection Act: Right to Safety, Right to be Informed, Right to Choose, Right to be Heard, Right to seek Redressal, Right to Consumer Protection; Responsibilities of Consumers: Be Quality Conscious, Beware of Misleading Advertisements, Responsibility to Inspect a Variety of Goods before Making Selection, Collect Proof of Transaction, Consumers Must be Aware of Their Rights, Complaint for Genuine Grievances, Proper use of Product/Services; Consumer Protection Council: The Central Consumer Protection Council [Section 4,5,6], The State Consumer Protection Councils, The District

Consumer Protection Councils [Section 8-A]; Jurisdiction of Consumer Courts; Consumer Disputes Redressal Agencies: District Forums, State Commission; Role of Non-Governmental Organisations; Limitations of Consumer Protection Act, 1986

The Information Technology Act, 2000

Marks: 15

Introduction; Objectives; Application of the Act; Short Title, Extent, Commencement and Application of the Act [Sec 1]; Definitions of Certain Words, Terms, Concept Used in the Act; Digital Signature: Digital Signature Certificate, Authentication of Electronic Records, authentication of Creation of Digital Signature, Authentication of Verification of Digital Signature; Electronic Governance: Legal Recognitions of Electronic Records, Legal Recognition of Digital Signatures, Electronic Records and Use of Electronic Record and Digital, Signatures in Government and Its Agencies, Retention of Electronic Records, Publication in Electronic Gazette, Protected System, Power of Central Government to Make Rules in respect Of Digital Signature; Attribution, Acknowledgement and Despatch of Electronic Records: Attribution of Electronic Records [Sec11], of Acknowledgement of Receipt [Sec12], Time and place of dispatch and receipt of electronic record [Sec13]; Secure Electronic Records and Secure Digital Signatures: Secure Electronic Record [Sec14], Secure Digital Signature [Sec15], Security Procedures [Sec16]; Regulation of Certifying Authorities: Appointment of the Controller of Certifying Authorities and Other Officers, Functions of the Controller of Certifying Authorities, appointment of Certifying Authorities to Issue Digital Signature, to Issue Digital Signature Certificate; Terms and Conditions of Licence to Issue Digital Signature Certificate; Issuance of Licence, Validity of Licence, Commencement of Operation by Licensed Certifying Authorities, renewal of Licence, Provisions of Sec 24 Relating to the procedure for Grant / Rejection of Licence, revocation of Licence, Suspension of Licence, Notice of Suspension or Revocation of Licence, Surrender of Licence; Powers of Controller of Certifying Authorities; Duties and Responsibilities of Certifying Authority: The Need for a Certification Authority, Duties of Certifying Authorities, Certification Practice Statement, Display of License, Surrender of License, Service Charges; Digital Signature Certificates: Procedure to be Followed by Certifying Authorities to Issue Digital Signature Certificates, ; Duties of Subscribers; Penalties and Adjudication: Penalty for Damage to Computer, Computer System, etc., Penalty for Failure to Furnish Information Return, etc, Residuary Penalty, Power to Adjudicate, Factors to be Taken into Account by the Adjudicating Officer; Offences under I.T. Act; Miscellaneous Provisions of the I.T. Act; Drawbacks of the Act

The Patents Act, 1970

Marks: 12

Introduction: Meaning of ‘Property’ and ‘Intellectual Property’, Intellectual Property Rights; The Patents Act, 1970: Application of Patent, Grant of Patents and Rights Conferred Thereby; Patents of Addition [Section 54]: Term of Patents of addition [Section 55], Validity of Patents of Addition [Section 56], Advantages of Patents; The Copyright Act, 1957: Meaning of ‘ Copyright’, Works in which Copyright Subsists and Works in which Copyright Does not Subsist[Section 13], Ownership of Copyright and the Rights of the Owner [Section 17], Term of Copyright, Registration of Copyright, Other Provisions of the Copyright Act of 1957, Nature and Features of Copyright Act, Difference Between Patent and Copyright Act; The Design Act, 2000: Definition and Meaning, Nature and Feature of Design, Prohibition of Registration of certain Designs under the Act, Registration of Design, Powers and Functions of Controller; The Trade Mark Act, 1999: Meaning of ‘Trade Mark’, Some important Aspects of the Trade Marks Act of 1999

Reference Books:

1. Balachandran, V. and Thothadri, S., 2009. *Business Law*, 2nd ed., Tata McGraw Hill.
2. Bose, D. C., 2010. *Business Law*, Publication PHI Learning Private Ltd.
3. Dr. Sharma, A., 2010. *Company Law and Secretarial Practice*, 11th ed., VK Enterprises.
4. Gulshan, S. S., and Kapoor, G. K. *Business and Corporate Laws* 2nd ed., New Age International Publishers.
5. Jain Shail., 2010. *Patents: Procedures and Practices*, Universal Law Publishing.
6. Mathur, S. B., 1974. *Business Law*, Published by Tata McGraw Hill.
7. Moshal B., 2008. *Business & Industrial Law*. Ane Books Pvt. Ltd.

0203158: SOFTWARE ENGINEERING

Full Marks: 100

Introduction to Software Engineering

Marks: 13

The Problem Domain: Industrial Strength Software, Software: Late and Unreliable, Software: Maintenance and Rework; Software Engineering Challenges: Scale, Quality and Productivity, Consistency and Repeatability, Change; Software Engineering Approach: Phased Development Process, Managing the Process, Requirement Analysis, Software Design, Coding, Testing

Software Process

Marks: 12

Introduction to Software Process; Software Process Model: Linear Sequential Model, Prototyping Model; RAD Model 20; Evolutionary Software Process Model: The Incremental Model, The Spiral Model, The Concurrent Development Model; Component Based Model; Process Technology

Software Development Life Cycle

Marks: 11

Introduction to Software Development Life Cycle; Requirement Analysis; Feasibility Study; Coding; Testing; Integration and Testing; Maintenance; Systems Analysis and Design

Software Requirement Specification

Marks: 15

Waterfall Model; Prototyping Model; Iterative Model; Spiral Model; Role of Management in Software Development; Problem Analysis; Requirement Specification

System Design

Marks: 15

Problem Partitioning; Abstraction; Top-Down and Bottom-Up Design; Structured Approach; Function v/s Object Oriented Approach; Design Specification and Verification

Coding

Marks: 11

Top-Down and Bottom Up Approach; Structured Programming; Information Hiding; Programming Style; Internal Documentation

Testing

Marks: 11

Levels of Testing: Functional, Structural, Test Plan, Test Cases Specifications, Assessment

Software Project Management

Marks: 12

Cost Estimation; Project Scheduling; Staffing: Benefits and drawbacks of IT staffing; Software Configuration Management; Quality Assurance; Project Monitoring; Risk Management

Reference Books:

1. Sharma P., 2004. *Software Engineering*, APH Publishing.
2. Sommerville, I. and Sawyer, P., 1997. *Requirements engineering: a good practice guide*, John Wiley and Sons.
3. Sundar, D., 2010. *Software Engineering*, Laxmi Publications, Ltd.

4. Thayer, H. R., 1997. *Software engineering project management*, IEEE Computer Society.
5. Vliet, V. H., 2000. *Software engineering: principles and practice*, 2nd ed., John Wiley.
6. Young, R. R., 2004. *The requirements engineering handbook*, Artech House.

0203051: DATABASE MANAGEMENT SYSTEM

Full Marks: 100

Database Management System

Marks: 10

Database: An Introduction; Conventional File Oriented System: Disadvantages of Conventional File Oriented System; Database Organisation; Basic Components of DBMS; Advantages and Disadvantages of DBMS; Database Design: Design Process, Advantages of Developing a Database Designing Model

Data Modelling

Marks: 8

Introduction to Database Modelling; Types of Data Models: Record Based Data Modelling, Hierarchical Data Model, Network Data Model, Data Models; Object Based Data Model

Introduction to Relational Database Management Systems

Marks: 14

Relational Database Management System; The Relational Data Structure; Keys; Constraints: Domain Constraints: Domain Constraints, Entity Integrity Constraint, Referential Integrity, Constraints, Entity Integrity Constraint, Referential Integrity, Operational Constraints; Codd's 12 Rules

Relational Database Management Systems and Normalisation

Marks: 14

Relational Database Design; Key Constraints; Introduction to Normalisation: Problems Addressed by Normalisation, ; Normal Forms: First Normal Form (1NF), Second Normal Form (2NF), Third Normal Form, Boyce-Codd Normal Form, Fourth Normal Form (4NF)

Database Design and Entity-Relationship Modelling

Marks: 15

Introduction of Design Process: Design Process, Design Alternatives; The Entity-Relationship Model; Components of an E-R Model: Entities and Entity Sets, Attributes; Entity-Relationship Diagram: Relationships and Relationship Sets, Terms Associated With Entities and Relationships, Other Styles of ER Diagram; Roles in ER Diagrams; Generalisation; Aggregation

SQL: Queries and Subqueries

Marks: 13

Introduction; SQL Data Types; Clauses in SQL; Types of Functions; Joining Tables; Subqueries: Predicate Subqueries, Quantified Subqueries, Scalar Subqueries, Correlated Subqueries, Table Subqueries; Grouping Queries; Union Queries; SQL Data Manipulation Language (DML); Data Definition Language (DDL); Views: Updating a View, Dropping a View

Database Security and Integrity

Marks: 13

Introduction to Database Security; Threats: Data Tampering, Identity Threats, Data Theft and Eavesdropping, -Related Threats, Unauthorised Access to Tables and Columns, Unauthorised Access to Data Rows; Data Security Requirements: Vulnerability Assessments, Monitoring of Database Protocol Traffic (SQL), Access Control, Authentication, Integrity,

Availability; Roles; Granting and Revoking Privileges and Roles; Digital Signatures as Passwords for Data Security; Introduction to Data Integrity; Integrity Constraints: Entity Integrity Constraints, Integrity, Level Integrity, Integrity

Structure, Components, Functions and Implementation of Database Management System

Marks: 13

Structure of DBMS; Execution Steps; Components; Functions and Services of a DBMS; Types of Database Systems: Centralised Database System, Parallel Database System, Client/Server Database System, Distributed Database Systems; Database Administrator; Transaction Processing: ACID criteria (Atomicity, Consistency, Isolation, Durability), Benefits of Transaction Processing, Implementation

Reference Books:

1. Gertz, M. & Jajodia, S., 2008. Handbook of database security: applications and trends, Springer.
2. Group, I., . Introduction to Database Management Systems, Tata McGraw-Hill Education.
3. McNicholas, M., 2007. Maritime security: an introduction, Butterworth-Heinemann.
4. Majumdar, 2001. Int To Dbms , Tata McGraw-Hill Education.
5. North, K., 1995. Windows multi-DBMS programming: using C++, Visual Basic, ODBC, OLE2 and tools for DBMS projects, Wiley.
6. Singh, K. S., 2009. *Database Systems: Concepts, Design and Applications*, 3rd ed., Pearson Education India.

0203264: COMPUTER NETWORKS AND TOOLS

Full Marks: 100

Fundamentals of Computer Network

Marks: 18

Introduction to Computer Network; Historical Background; Classification Based on Transmission Technology; Classification Based on Scale; Metropolitan Area Networks (MAN); The Internet; Data Representation; Data Communication; Communications Channels; Digital and Analog Transmission; Asynchronous and Synchronous Transmission; Types of Communication Services; Serial Communication

OSI Reference Model and Protocols

Marks: 25

The Need For Standards; ISO - Organisation for Standardisation: 2.2.1 The OSI Reference Model, A Layered Network Model; The Seven OSI Reference Model Layers; RS-232: Scope of the Standard; Stop-and-Wait Flow Control: Basic Idea of Flow Control, Idea of Error Control; Frame Correct First Time; Automatic Repeat Request (ARQ); Frame Synchronisation: Character-oriented Protocols, Bit-oriented Protocol, Length Counts Framing; Framing Errors; DLC Standards; Control Frames; High-level Data Link Control (HDLC); X.25 Protocol: X.25 Devices and Protocol Operation, Packet Assembler/Disassembler (PAD), X.25 Session Establishment, .25 Virtual Circuits, X.25 Protocol Suite; Packet-Layer Protocol (PLP): Four Types of PLP Packet Fields Exist; Token Bus Network; Token Ring

Multiplexing and Network Layers

Marks: 20

Multiplexing; Time Division Multiplexing; Time Slots and Frames; Data Rate Management; Pulse Stuffing; Statistical Time-Division Multiplexing; Switched Network; Switching Technology; Network Layer in the Internet; IP Protocol; IP Addresses; Subnets; CIDR—Classless InterDomain Routing; Internet Control Protocols; ARP—The Address Resolution Protocol; RARP, BOOTP, and DHCP; OSPF—The Interior Gateway Routing Protocol; BGP—The Exterior Gateway Routing Protocol

Application Layer and Protocols

Marks: 22

Introduction to Application Layer; Domain Name System; Structure; Simple Network Management Protocol; Overview and Basic Concepts of SNMP; Network Connecting Devices; LAN Connecting Devices; Internetworking Devices; Network Security; Cryptographic Algorithms; Secret Key Encryption (DES); Public-key Cryptography; Working of Public Key in Detail; Description of Public Key; ATM - Asynchronous Transfer Mode; Frame Relay; ISDN; Very Small Aperture Terminal (VSAT); Global Positioning System (GPS)

Distributed Computing

Marks: 15

Introduction; Parallel and Distributed Computing; History; Applications; Theoretical Foundations; Other Problems; Properties of Distributed Systems; Architectures

Reference Books:

1. Acharya. V., 2006. *TCP/IP Distributed System*. Laxmi Publications.
2. Banzal. S., 2007. *Data and Computer Network Communication*. Firewall Media.
3. Bidgoli. H., 2004. *The Internet encyclopedia, Volume 1*. John Wiley and Sons.
4. Black. U. D., 1993. *Computer networks: protocols, standards, and interfaces*. PTR Prentice Hall.
5. Carpenter. T., 2009. *CompTIA Convergence+ Certification Study Guide*. McGraw Hill Professional.
6. Reynolds. C. and Tymann. P. T., 2008. *Schaum's outlines: Principles of computer science*. McGraw-Hill Professional.
7. Tanenbaum. A. S., 2003. *Computer networks*.

0203265: BUSINESS INTELLIGENCE TOOLS

Full Marks: 100

Business Intelligence

Marks: 8

The Birth of BI; What is Business Intelligence?; History; Customer Relationship Management; What is a Data Warehouse?: The Invention of the Data Warehouse, Extraction, Transformation and Loading; What are Queries and Reports?; What is OLAP?: An OLAP Example; FASMI; OLAP Applications; What is Data Mining?: The Data Mining Process, Mining Techniques, Web Mining; The Internet-variant of Mining; Business Intelligence vs. Decision Support Systems; Current Status; Application Areas; Competitive Intelligence

Components of Business Intelligence Tools

Marks: 10

Introduction; Business Driving Forces; How to Identify BI Candidates?; Main BI Terms: Operational Databases, OLTP, Data Warehouse, Data Mart, External Data Source, OLAP, OLAP Server, Metadata, Drill-Down, Operational Versus Informational Databases; Different BI Implementations: Summary Table, OLTP Data at Separate Server, Single Data Mart; Data Warehouse Components; Data Sources

Open Source Tools for Business Intelligence

Marks: 15

Introduction; Criteria for all Tool Categories; Criteria for Extract-Transform-Load Tools; Criteria for Database Management Systems; Criteria for On-Line Analytical Processing Servers; Criteria for On-Line Analytical Processing Clients: Extract-Transform-Load Tools, Apatar, Clover.ET, ETL Integrator, KET, Kettle / Pentaho Data Integration, Octopus, Palo ETL Server, Pequel, Scriptella, Talend Open Studio / JasperETL; Database Management Systems: Firebird,

Ingres Database, LucidDB, MonetDB, MySQL, PostgreSQL, On-Line Analytical Processing Servers, Mondrian / Pentaho Analysis Services, Palo; On-Line Analytical Processing Clients: JPivot, JRubik, OpenI, Rex, Integrated Business Intelligence Suites, Pentaho Open BI Suite, SpagoBI; Conclusion; Adopting proprietary/standards-based Business Intelligence; Using Open Source Business Intelligence Tools: Downsides of Adopting Proprietary/Standards-Based Business Intelligence (BI), Advantages of Using Open Source BI tools, Adoption of Open Source BI tools

Business Analytics

Marks: 14

Introduction; Where Should we Leverage Business Analytics?; What's the payoff?; Business Analytics and Customer Relationships: Valuation, Customisation, Pricing, Retention, Fraud Detection; What Information and Technology do we Need?; What Kinds of people do we need?; Key Asset: People; Watershed Event: Merger or Acquisition; Business Intelligence Benefits and Challenges; CSFS Finding and Discussion; Committed Management Support and Sponsorship; Clear Business Vision and Well-Established Case; Strategic and Extensible Technical Framework; Concluding Remarks and Future Research

Data Warehousing and Data Mart

Marks: 11

Introduction; The Corporate Information Factory; Getting Data In: Operational Systems, and Transformation, Data Warehouse, Operational Data Store, Data Management; Getting Information Out; Data Delivery: Data Mart, Decision Support Interface (DSI), Transaction Interface (TrI); Meta data: What is a Data Mart?; How is Data Mart Different from a Data Warehouse?; Dependent and Independent Data Marts; What are the Steps in Implementing a Data Mart?: Designing, Constructing, Populating, Accessing, Managing; Patterns of Data Mart Development; Development Models without Explicit User Feedback; Development Models with Feedback; The Dynamics of Data Mart Development

An Introduction to OLAP

Marks: 14

Introduction; Why do we need OLAP?: Increasing Data Storage, Data versus Information, Data Layout; OLAP Fundamentals; What is a Cube?; Multidimensionality: Four Dimensions and Beyond, "Slicing & Dicing", Nested Dimensions; Hierarchies & Groupings: "Drill-down", "Drill-up" & "Drill-across"; Consolidated Data: Pre-consolidated versus On-Demand, Data; Storing the Data: ROLAP, MOLAP, HOLAP; OLAP as a Component of Business Intelligence; Enterprise Performance Management; Data Warehousing; Business Reporting; Predictive Analytics and Data Mining; OLAP: Why OLAP?; Business-Focused Multidimensional Data; OLAP System Components: Server, storage, Calculation engine, Front-end analysis and reporting tools; OLAP Types: Multidimensional OLAP, Relational OLAP, Hybrid OLAP; OLAP Products; Typical OLAP Applications; Oracle OLAP: Database-Centric OLAP

Decision Support Systems

Marks: 16

Introduction; Evolution of Decision Support Systems; Definition of Decision Support Systems; Architecture of Decision Support Systems; Decision Support System Sub-Specialities; Data/Model Management; User Interface Sub-Systems; Knowledge-Based Decision Support Systems; Types of Decisions; Human Judgment and Decision Making; Modelling Decisions; Decision Support Systems: Database Management System (DBMS), Model-Base Management System (MBMS), Dialog Generation and Management System (DGMS) Normative and Descriptive Approaches; Systems with Static Domain Models: Systems with Customised Decision Models; Systems Capable of Learning a Model from Data; Equation-Based and Mixed Systems; User Interfaces to Decision Support Systems, Support for Model Construction and Model Analysis, for Reasoning about the Problem Structure in Addition to Numerical Calculations, Support for Both Choice and Optimisation of Decision Variables Graphical Interface

Types of Business Intelligence Tools

Marks: 12

Introduction; The Key General Categories of Business Intelligence Tools: Spreadsheets, Reporting and Querying Software, Increasing Data Storage, Dashboard, Data Mining, The Foundations of Data Mining, Data Warehousing, Decision Engineering, Process Mining, Business Performance Management, The BPM Imperative, Local Information

System; Eight Strategies for Delivering Business Intelligence on the Web: Pick the best delivery vehicle for your audience and your data, Integrate The Presentation Layer, Integrate the Security Layer, the Presentation for Target Devices and User Roles, Target Reports to Users, Use a Combined Push/Pull Model, Keep Information Timely, Take Advantage of Enterprise Application Integration (EAI); Use Analytics for Strategic Business Information Implementation; Life in the Fast Lane; Modelling for Company Wide Coordination; Talk to the Boss; Making the Operational Case for Data Warehousing Making Our Case; Who Gets the Bill?

Reference Books:

1. Agnew, P. & Silverstone, L., 2009. *The Data Model Resource Book: Universal Patterns For Data Modeling*, John Wiley & Sons Publication.
2. Becerra-Fernandez, I. & Sabherwal, R., 2010. *Business Intelligence*, John Wiley & Sons Publication.
3. Berson, 2004. *Data Warehousing, Data Mining, & Olap*, Tata McGraw-Hill Education Publication.
4. Chao, L., 2009. *Utilizing Open Source Tools for Online Teaching and Learning: Applying Linux Technologies*, Idea Group Inc (IGI) Publication.
5. Evans, J., 2012. *Business Analytics*, Pearson College Division Publication.
6. Fernandez, I. & Sabherwal, R., 2010. *Business Intelligence*, John Wiley & Sons Publication.
7. Gonzales, M., 2003. *IBM Data Warehousing: With IBM Business Intelligence Tools*, Wiley Publication.