

# **Index**

Semester -2nd MCA PYQ Bank

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## Semester – II

### **MC – 201: Fundamentals of Management and Organization Behavior**

#### **Unit – I**

**Concepts of Management:** Definition, Nature and Scope; An overall View of Man. Relation with other social sciences and industry Evolution of Management Thought Classical theory of Management, Bureaucracy- Introduction by Max Weber, Scientific Management -P.W Taylor and his followers, Process Management- introduced by H. Fayol and others.

#### **Unit – II**

**Neo-Classical Theory of Management:** Human Relations - E. Mayo and Roethlisberger. Behavioral Science approach - by McGregor, Maslow and others, Modern Management theories : Peter Drucker.

**Management Functions:** Planning, Staffing, Directing and Controlling. **Executive Functions:** Production, Marketing, finance, Personnel. **Planning:** Concept, Nature, Importance, Procedure, Strategies and Method of Decision Making.

**Organizations:** Definitions, Theories of Organization, Forms of Organization. Forms of Organization. Formal and Informal Organization, Types of Formal Organization, Line and Staff Relationship, Span of Management, Authority, Responsibility, Delegation, Centralization, Decentralization. Committees.

#### **Unit – III**

**Organization Behavior:** Introduction to Organization Behavior: Historical roots of Organizational Behavior, Fundamental concepts, Nature, Emerging trends in the organizational behavior, Limitation of Organization Behavior, Challenges & Opportunities for Organization Behavior Motivation- Importance of motivation at work, approaches to motivation, content theories, process theories, motivation and its effects, McGregor theory X and Y, Maslow's need hierarchy, Herzberg's two factor theory, Vroom expectancy theory, OB modification.

#### **Unit – IV**

**Power and Politics:** Definition and nature of Power, Types of Power, Contingencies of Power, Organizational Politics, where does it occur, Types of political activity, Political strategies for power acquisition in modern organization, Coping with organizational politics. Empowerment. Organizational politics and its effects, Organizational politics and ethics. Conflicts and Negotiation.

**Leadership:** Concept and style, Fiedler's contingency mode, path-goal theory, leadership effectiveness.

#### **Reference Books**

1. Narender. K. Chadha, **Perspectives in Organizational Behavior**, Galgotia Publications Pvt. Ltd., New Delhi, 2007
2. F. Luthans, **Organizational Behavior** (9<sup>th</sup> ed.), McGraw-Hill companies Inc., 2002
3. J. Greenberg, R.A. Baron, **Behavior in Organizations** (8<sup>th</sup> ed.), Pearson Education Inc, 2005
4. Masse, •Essentials of Management u, 4th edition, Prentice Hall of India, 1996.
5. Agarwal, R.D., **Organization and Management** Tata McGraw Hill, 1986.

## **MC – 202: Data Analytics**

**Objective:** To discuss various real-world scenarios where analytics has been used to solve problem and also explains as to how it helps in different domains.

### **Unit – I**

**Introduction:** data science, need for analytics, steps in data analysis projects, Data-sources of data, data sets, data warehouses, data types, privacy, and confidentiality, samples vs. population, Data summarization and visualization: tables and graphs.

### **Unit – II**

**Data Preprocessing:** cleaning, transformation, dimensionality reduction, Data Analysis and Visualization: descriptive, inferential statistics, uni-variate and multi-variate analysis

### **Unit – III**

**Grouping:** Cluster Analysis: distance measures, partitioning, hierarchical, density-based methods,

### **Unit – IV**

Market Basket Analysis, Association Analysis, Market Basket Analysis, Classifiers: Bayesian, k-nearest neighbor, neural network, Support Vector Machine, Decision Trees,

### **Unit – V**

**Prediction:** Regression models, Evaluating Classification and Predictive performance, ensemble methods, Anomaly Detection, Forecasting models

### **Unit – VI**

**Applications in Data Analytics:** Case studies, Web Mining, Text Mining, Business Intelligence, Supply Chain Analytics, Time series, Spatial Data Analysis.

### **Reference Books**

1. Glenn J. Myatt, Wayne P. Johnson, *Making Sense of Data I: A Practical Guide to Exploratory Data Analysis and Data Mining*, 2nd Edition, John Wiley & Sons Publication, 2014.
2. Glenn J. Myatt, Wayne P. Johnson, *Making Sense of Data II: A Practical Guide to Data Visualization, Advanced Data Mining, and Applications*, John Wiley & Sons Publication, 2009.
3. Galit Shmueli, Nitin R. Patel, and Peter C. Bruce, *Data Mining for Business Intelligence*, John Wiley and Sons, 2014.
4. Ian H. Witten, Eibe Frank, Mark A. Hall, *Data Mining: Practical Machine Learning Tools and Techniques*, Morgan Kaufmann, 2011.

## **MC – 203: Java Programming**

**Objectives:** To learn and write programs in Java using object-oriented paradigm. Approach in this Course is to take Java as a language that is used as a primary tool in many different areas of programming work

### **Unit – I**

**Introduction:** Java and Java Applications, Features, Bytecode and Interpretation, JDK, JVM; Object-Oriented Programming, Simple Programs; Data Types, Variables, Arrays and Type Conversions; Operators and Expressions; Control Statements: Selection Statements, Iteration Statements and Jump Statements. **Classes and Objects:** Classes in Java, Declaring a Class, Creating Instances of Class, Members of a Class, Method Overloading; Different Types of Constructors, Inner Class; Uses of this Keyword; Garbage Collection; Recursion; Access Control; Static Members.

### **Unit – II**

**Inheritance:** Introduction; Method Overriding and Dynamic Method Dispatch; Uses of super and final Keywords; Command Line Arguments; Varargs; Enumerations;

**Exception Handling:** Exception Handling in Java.

**Packages and Interfaces:** Packages, Importing Packages; Interfaces.

**I/O:** Basics, Console I/O, Reading and Writing Files;

**Generics:** Overview, Examples, Multiple Generic Parameters, Bounds, Wildcards, Generic Methods, Interfaces and Classes.

**Collections:** Overview, Interfaces, Classes – Array List, Linked List, Hash Set and Map. **Applets:** What are Applets? The Applet Class; The Applet and HTML; Life Cycle of an Applet; The Graphics Class; Painting the Applet; User Interfaces for Applet; Adding Components to user interface; AWT Controls.

### **Unit – III**

**Multi-threaded Programming:** Introduction; Creating Threads: Extending Threads; Implementing Runnable; Synchronization, Priorities, Inter-Thread Communication, Thread States and Methods on Thread Objects.

**Event Handling:** Two Event Handling Mechanisms; The Delegation Event Model; Event Classes; Sources of Events; Event Listener Interfaces; Using the Delegation Event Model; Adapter Classes; Inner Classes.

**Java Database Connectivity (JDBC):** The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC Process; Database Connection; Statement Objects; Result Set; Transaction Processing; Metadata, Data Types; Exceptions.

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## **Unit – IV**

**Networking:** Basics, Useful Classes and Interfaces, Inet Address, Sockets, URI, URL, URL Connection, Http URL Connection, Datagrams.

**Java Beans:** Introduction, Advantages, Introspection, Bound and Constrained Properties, Persistence, Customizers, Java Beans API.

## **Unit – V**

**Servlets:** Background, Life Cycle, Development Options, Tomcat, Example, Servlet API, Reading Parameters, javax. servlet. http Package, Handling HTTP Requests and Responses, Using Cookies, Session Tracking.

**Java Server Pages (JSP):** JSP; JSP Tags; Tomcat; Request String; User Sessions; Cookies; Session Objects.

### **Reference Books**

1. Jim Keogh, **J2EE - The Complete Reference**, Tata McGraw Hill, 2008.
2. Herbert Schildt, **Java - The Complete Reference**, McGraw Hill Education, 2014, 9<sup>th</sup> Edition.
3. Gavin King et.al., **Java Persistence with Hibernate**, Manning Publications, 2016, 2<sup>nd</sup> Edition.
4. Cameron McKenzie, **Hibernate Made Easy**, Pulpjava, 2008
5. Phil Hanna, **JSP 2.0: The Complete Reference**, Osborne

## **MC – 204: Data Structures and Algorithms**

**Objectives:** To impart knowledge in fundamentals of programming elements with a view to developing professional software development skills.

### **Unit – I**

**Introduction to Data Structures:** Elementary Data Structures - Stacks, Queues, and Linked Lists with Applications Implementing Pointers and Objects, Representing Rooted Trees - Hash Tables - Direct Address Tables, Hash Tables, Hash Functions, Open Addressing - Binary Search Trees - Querying a Binary Search Tree, Insertion and Deletion.

### **Unit – II**

**Advanced Data Structures:** Red-Black Trees - Properties, Rotations, Insertion and Deletion - B-Trees - Definition, Basic Operations, Deleting a key from B-Tree - Graphs - Representations, Breadth-First and Depth-First Searches - Data Structures for Disjoint Sets - Operations and Representations.

### **Unit – III**

**Introduction to Algorithms:** Algorithms - Definition, Complexity Concepts, Asymptotic Notations, Recurrences and Solutions - Design Strategies - Recursion, Divide-and-Conquer, Greedy and Dynamic Programming -Complexity Analysis of Sorting Algorithms - Insertion, Selection, Bubble, Quick and Heap Sorting Techniques. - Searching Algorithms - Linear and Binary Search Selection in Linear Time.

### **Unit – IV**

**Graph Algorithms:** Greedy Strategy - Elements of the Strategy, Explanation with Huffman Coding as Example - Minimum Spanning Trees – Kruskal's and Prim's Algorithms - Single-Source Shortest Paths - All-Pairs Shortest Paths - Topological Sort.

### **Unit – V**

**Selected Topics and Tractability:** Polynomials and FFT, Probabilistic Algorithms Introduction, Probabilistic Methods for Selection, Sorting and Searching - Algorithms for Random Number Generation - Basic Concepts of NP-Hard and NP-Complete Problems - Cook's Theorem (Without Proof) - Reduction - Clique Decision Problem.

### **Reference Books**

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Second Edition, 2001 , PHI.
2. Ellis Horowitz, Sartaj Shani, and S.Rajasekaran, "Fundamentals Of Computer Algorithms" 2000, Galgotia.
3. G. Brassard and P.Bratley, "Fundamentals of Algorithmics", 1995, PHI.
4. E.Horowitz, S.Sahni, and S. Anderson, "Fundamentals of Data Structures in C." 1992, W.H.Freeman and Co.
5. M.A. Weiss and i. Thompson, "Data Structures and Algorithm Analysis", Second Edition, 1991, Pearson Publishers.

## **MC – 205: Artificial Intelligence and Knowledge Management**

**Objectives:** To study the concepts of artificial Intelligence and methods of solving problems using Artificial Intelligence and introduce the concepts of Knowledge Management.

### **Unit – I**

**Introduction and Problem Solving:** Various definitions of AI, Introduction to AI applications and AI techniques, Production systems, control strategies, reasoning - forward & backward chaining

**Intelligent Agents - Definitions:** Definitions of a rational agent, reflex, model-based, goal-based, and utility-based agents, the environment in which a particular agent operates

### **Unit – II**

**Search and Game Playing:** Breadth first search, depth first search, iterative deepening, uniform cost search, hill climbing, simulated annealing, genetic algorithm search, heuristic search, Best first search, A\* algorithm, AO\* algorithm, Minmax & game trees, refining minmax, Alpha – Beta pruning, constraint satisfaction

### **Unit – III**

**Knowledge Representation:** First order predicate calculus, resolution, unification, natural deduction system, refutation, logic programming, PROLOG, semantic networks, frame system, value inheritance, conceptual dependency, Ontologies

### **Unit – IV**

**Planning:** basic representation for planning, symbolic-centralized vs. reactive-distributed, partial order planning algorithm

**Uncertainty:** different types of uncertainty - degree of belief and degree of truth, various probability constructs - prior probability, conditional probability, probability axioms, probability distributions, and joint probability distributions, Bayes' rule, other approaches to modeling uncertainty such as Dempster-Shafer theory and fuzzy sets/logic

### **Unit – V**

**Natural language processing:** component steps of communication, contrast between formal and natural languages in the context of grammar, parsing, and semantics

### **Reference Books**

1. Elaine Rich, "Artificial Intelligence", 1985, McGraw Hill.
2. Nilsson N.J., "Principles of Artificial Intelligence", 1992, Narosa.
3. Hayes & Roth, "building Expert Systems", 1982, Narosa

### **MC – 206: Program Elective – 1**

One elective course from the list will be offered if minimum 1/3<sup>rd</sup> of MCA-II Semester students will opt for the same or it will be decided by the concerned department or authority.

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**MC – 207: Programming Lab – 1**

- Java Programming

**MC – 208 Programming Lab – 2**

- Data Structures and Algorithms

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## **MCPE – 105: Client / Server Technology**

**Objective:** To provide knowledge of developing systems in distributed environments.

### **Unit – I**

**Overview of Client/Server Computing:** What is Client/Server Computing Application Tasks: Rightsizing, Benefits of Client/Server Computing, Evolution of Client Server Computing, Hardware and Software Trends, Evolution of operating systems, Networking Trends, Business considerations.

### **Unit – II**

**Client/Server Applications:** Components, Classes, Categories Understanding client/Server Computing: Obstacles, Open Systems and Standards, Standards setting organizations. Factors for success, RPC messaging Peer to Peer.

### **Unit – III**

**Client Hardware and Software:** Client Components, Client Operating Systems, GUI, Database Access, Application Logic. Server Hardware and Environment, Categories of Servers. SQL DB Servers, Network management and Network Computing Environment, Network operating systems, Loadable Module, Middleware, Data warehousing.



### **Unit – IV**

**Client/Server requirements:** GUI Design standards interface Independence, Platform independence, Transaction Processing, Connectivity, Reliability, Back up and Recovery mechanisms, TP Monitors, Groupware, and Distributed Object Components.

### **Unit – V**

Future Trends - CORBA, COM, OLE, WEB Server, Mobile Computing, Net Management Standard, intelligent Wiring Hubs, Wireless LANS, ATM Switching, Object Technology, CASE Tools, Repositories, Multimedia, Workgroup Computing.

### **Reference Books**

1. Dawna Travis Dewire, 'Client/SerVer Computing", 1993, McGraw Hill
2. Bruce Elbert & Bobby Martyna, "Client/Server Computing:Architecture. Applications and Distributed Systems Management", 1994, Artech House.
3. Robert Orgall, Dan Harkay & Jeri Edwards, "The Essential Client/Server Survival Guide".

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