

MCA Syllabus Second Semester

ORGANIZATIONAL STRUCTURE AND PERSONNEL MANAGEMENT MCA 201

Unit –I

Organization Structure :---

Classical theories of Management :--- Scientific management theory , Fayol's 14 principles of Management , Weber's bureaucratic theory. Definition of organization and organization Structure.

Some concepts regarding Organization Structure :--- Line and Staff authority , Centralization and Decentralization , Span of control , Formal and Informal Organization.

Forms of organization structure and features :--- Function based , Product based , Geography based , Project based (Matrix)

Organization Design :--- Mechanistic and Organic Structure , Virtual and Network organization Structure

Unit-II

Motivation :--- Definition of Motivation , Importance of Motivation , Motivation and behavior , Theories of Motivation – Maslows need Hierarchy , Two- Factor Theory , McClelland 's Need Theory , Theory X and Theory Y.

Unit- III

Nature and Scope of Human resource Management :--- Scope of HRM , HRM– functions and objectives , HRM model.

Personnel Function :--- Personnel policies and principles , duties and responsibilities of personnel manager , differences between HRM and PM Emerging trends of personnel management in India

Unit-IV

Human Resource Planning :--- Meaning , definition and importance of HRP.

Job analysis :--- Meaning and definition , process of job analysis.

Recruitment :--- Meaning and definition , importance , sources of recruitment. Indian scenario

Selection :--- Meaning and definition , selection process , types of interview

Unit-V

Training and Development :--- Nature of training and Development , Inputs in training and Development , importance of training and Development , training process , training of International assignment

Reference Books :---

1. L. M. Prasad, "Organizational Behavior", S. Chand.
2. V. S. P. Rao, P. S. Narayana, "Organizational Theory and Behavior", Konark Publishers Pvt. Ltd.
3. Tripathi, Reddy, "Principles of Management", TMH
4. Koontz, Weihrich, "Essentials of Management", TMH
5. Fred Luthans, "Organizational Behaviour", McGraw Hill
6. K. Aswathappa, "Human Resource and Personnel Management", TMH
7. L. M. Prasad, "Human Recourse Management", S. Chand

COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES **MCA 212**

Unit-I

Floating point Arithmetic: Representation of floating point numbers, Operations, Normalization, Pitfalls of floating point representation, Errors in numerical computation
Iterative Methods: Zeros of a single transcendental equation and zeros of polynomial using Bisection Method, Iteration Method, Regula-Falsi method, Newton Raphson method, Secant method, Rate of convergence of iterative methods.

Unit-II

Simultaneous Linear Equations: Solutions of system of Linear equations, Gauss Elimination direct method and pivoting, Ill Conditioned system of equations, Refinement of solution. Gauss Seidal iterative method, Rate of Convergence
Interpolation and approximation: Finite Differences, Difference tables
Polynomial Interpolation: Newton's forward and backward formula
Central Difference Formulae: Gauss forward and backward formula, Stirling's, Bessel's, Everett's formula.
Interpolation with unequal intervals: Langrange's Interpolation, Newton Divided difference formula, Hermite's Interpolation
Approximation of function by Taylor's series and Chebyshev polynomial

Unit-III

Numerical Differentiation and Integration: Introduction, Numerical Differentiation, Numerical Integration, Trapezoidal rule, Simpson's rules, Boole's Rule, Weddle's Rule
Euler- Maclaurin Formula
Solution of differential equations: Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta methods, Predictor-corrector method, Automatic error monitoring, stability of solution.

Unit-IV

Curve fitting, Cubic Spline and Approximation: Method of least squares, fitting of straight lines, polynomials, exponential curves etc
Frequency Chart: Different frequency chart like Histogram, Frequency curve, Pi-chart.
Regression analysis: Linear and Non-linear regression, Multiple regression

Unit-V

Time series and forecasting: Moving averages, smoothening of curves, forecasting models and methods. Statistical Quality Controls methods Testing of Hypothesis: Test of significance, Chi-square test, t-test, ANOVA, F-Test Application to medicine, agriculture etc.

References:

1. Rajaraman V., "Computer Oriented Numerical Methods", PHI
2. Gerald & Wheatley, "Applied Numerical Analyses", AW
3. Jain, Iyengar and Jain, "Numerical Methods for Scientific and Engineering Computations", New Age Int.
4. Grewal B. S., "Numerical methods in Engineering and Science", Khanna Publishers, Delhi
5. T. Veerarajan, T Ramachandran, "Theory and Problems in Numerical Methods", TMH
6. Pradip Niyogi, "Numerical Analysis and Algorithms", TMH
7. Francis Scheld, "Numerical Analysis", TMH
9. Gupta S. P., "Statistical Methods", Sultan and Sons

MCA-213 : DATA STRUCTURES USING 'C' **MCA 204**

Unit 1:

Introduction: Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time-Space trade-off Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered List, Sparse Matrices, and Vectors. Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Recursion: Recursive definition and processes, recursion in C, example of recursion, Tower of Hanoi Problem, simulating recursion. Backtracking, recursive algorithms, principles of recursion, tail recursion, removal of recursion.

Unit - II

Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty. Circular queue, Deque, and Priority Queue. Linked list: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list, Linked List in Array, Polynomial representation and addition, Generalized linked list,

Garbage Collection and Compaction.

Unit - III

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree. Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees. Traversing Threaded Binary trees, Huffman algorithm. Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation. 15

Unit - IV

Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting. Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees, B-trees.

Unit - V

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees. File Structures: Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices, B+ Tree index Files, B Tree index Files, Indexing and Hashing Comparisons.

References

Text Books

1. Y. Langsam, M. Augenstin and A. Tannenbaum, Data Structures using C and C++, Pearson Education Asia, 2nd Edition, 2002.
2. Ellis Horowitz, S. Sahni, D. Mehta Fundamentals of Data Structures in C++, Galgotia Book Source, New Delhi.

Reference Books

1. S. Lipschutz, Data Structures Mc-Graw Hill International Editions, 1986.
2. Jean-Paul Tremblay, Paul. G. Soresan, An introduction to data structures with Applications, Tata Mc-Graw Hill International Editions, 2nd edition 1984.
3. A. Michael Berman, Data structures via C++, Oxford University Press, 2002.
4. M. Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education, 2002, 2nd edition

MCA- 214 : PRINCIPLES OF MANAGEMENT

UNIT I (8 Sessions)

Management: Concept, Nature, Importance; Management : Art and Science, Management As a Profession, Management Vs. Administration, Management Skills, Levels of Management, Characteristics of Quality Managers. Evolution of Management: Early contributions, Taylor and Scientific Management, Fayol's Administrative Management, Bureaucracy, Hawthorne Experiments and Human Relations, Social System Approach, Decision Theory Approach. Business Ethics and Social Responsibility: Concept, Shift to Ethics, Tools of Ethics.

UNIT II (10 Sessions)

Introduction to Functions of Management Planning: Nature, Scope, Objectives and Significance of Planning, Types of Planning, Process of Planning, Barriers to Effective Planning, Planning Premises and Forecasting, Key to Planning, Decision Making. Organizing: Concept, Organisation Theories, Forms of Organisational Structure, Combining Jobs: Departmentation, Span of Control, Delegation of Authority, Authority & Responsibility, Organisational Design.

UNIT III (10 Sessions)

Staffing: Concept, System Approach, Manpower Planning, Job Design, Recruitment & Selection, Training & Development, Performance Appraisal Directing: Concept, Direction and Supervision Motivation: Concept, Motivation and Performance, Theories Of Motivation, Approaches for Improving Motivation, Pay and Job Performance, Quality of Work Life, Morale Building.

UNIT IV (12 Sessions)

Leadership: The Core of Leadership: Influence, Functions of Leaders, Leadership Style, Leadership Development. Communication: Communication Process, Importance of Communication, Communication Channels, Barriers to Communication. Controlling: Concept, Types of Control, Methods: Pre-control: Concurrent Control: Post-control, An Integrated Control System, The Quality Concept Factors affecting Quality, Developing a Quality Control System, Total Quality Control, Pre-control of Inputs, Concurrent Control of Operations. Post Control of Outputs. Change and Development: Model for Managing Change, Forces for Change, Need for Change, Alternative Change Techniques, New Trends in Organisational Change.

Suggested Reading:

1. Stoner, Freeman & Gilbert Jr - Management (Prentice Hall of India, 6th Edition)
2. Koontz - Principles of Management (Tata Mc Graw Hill, 1st Edition 2008)
3. Robbins & Coulter - Management (Prentice Hall of India, 8th Edition)
4. Robbins S.P. and Decenzo David A. - Fundamentals of Management: Essential Concepts and Applications (Pearson Education, 5th Edition)
5. Hillier Frederick S. and Hillier Mark S. - Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets (Tata Mc Graw Hill, 2nd Edition 2008)
6. Wehrich Heinz and Koontz Harold - Management: A Global and Entrepreneurial Perspective (Mc Graw Hill, 12th Edition 2008)

MCA-215 : COMPUTER ORGANIZATION

Unit-I

Register Transfer Language, Bus and Memory Transfers, Bus Architecture, Bus Arbitration, Arithmetic Logic, Shift Microoperation, Arithmetic Logic Shift Unit, Design of Fast address, Arithmetic Algorithms (addition, subtraction, Booth Multiplication), IEEE standard for Floating point numbers.

Unit-II

Control Design: Hardwired & Micro Programmed (Control Unit): Fundamental Concepts (Register Transfers, Performing of arithmetic or logical operations, Fetching a word from memory, storing a word in memory), Execution of a complete instruction, Multiple-Bus organization, Hardwired Control, Micro programmed control(Microinstruction, Microprogram sequencing, Wide-Branch addressing, Microinstruction with Next-address field, Prefetching Microinstruction).

Unit-III

Processor Design: Processor Organization: General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, Program Control, Reduced Instruction Set Computer.

Unit -IV

Input-Output Organization: I/O Interface, Modes of transfer, Interrupts & Interrupt handling, Direct Memory access, Input-Output processor, Serial Communication.

Unit-V

Memory Organization: Memory Hierarchy, Main Memory (RAM and ROM Chips), organization of 2D and 2^{1/2}D, Auxiliary memory, Cache memory, Virtual Memory, Memory management hardware.

Text Book

1. Computer System Architecture, M. Mano(PHI)

Reference Books

1. Computer Organization, Vravice, Zaky & Hamacher (TMH Publication)
2. Structured Computer Organization, Tannenbaum(PHI)
3. Computer Organization, Stallings(PHI)
4. Computer Organization, John P.Hayes (McGraw Hill)

