MCA-301 Software Engineering

Unit-I

System concepts and Information system environment:

The system concept, characteristics of system, elements of system, The System Development Life Cycle, The Role of System Analyst. Introduction system planning & initial investigation, various information Gathering tools feasibility study conretions & structures tools of system analysis, various methods of Process design, form design methodologies, introduction to information system testing, quality assurance security & destruct computer various (deleting recovery).

Unit-II

Software Process, Product and Project:


Unit-III

Software Project Planning and Design:


Unit-IV

Software Quality Assurance and Testing:


Unit-V

Advanced Topics:

MIS & DSS: Introduction to MIS, long range planning, development and implementation of an MIS, Applications of MIS in manufacturing sector and in service sector. Decision Support System concepts, types of DSS. Object Oriented Software Engineering: Object Oriented Concepts, Identifying the Elements of an Object Model, Management of Object Oriented Software Projects. CASE tools, Re-engineering

Books

3. Ian Sommerville : Software Engineering 6/e (Addison-Wesley
MCA-302 Object Oriented Programming with C++

Unit-I
Overview of C++: Object oriented programming, Concepts, Advantages, Usage. C++ Environment: Program development environment, the language and the C++ language standards. Introduction to various C++ compilers, C++ standard libraries, Prototype of main () function, Data types. C++ as a superset of C, New style comments, main function in C++, meaning of empty argument list, function prototyping, default arguments and argument matching. User defined data types: enumerated types, use of tag names, anonymous unions, scope of tag names Classes & Objects : Classes, Structure & Classes, Union & Classes, Inline Function, Scope Resolution operator, Static Class Members: Static Data Member, Static Member Function, Passing Objects to Function, Returning Objects, Object Assignment. Friend Function, Friend Classes

Unit-II
Array, Pointers References & The Dynamic Allocation Operators: Array of Objects, Pointers to Object, Type Checking C++ Pointers, The This Pointer, Pointer to Derived Types, Pointer to Class Members, References: Reference Parameter, call by reference and return by reference Passing References to Objects, Returning Reference, Independent Reference, C++’s Dynamic Allocation Operators, Initializing Allocated Memory, Allocating Array, Allocating Objects. Constructor & Destructor : Introduction, Constructor, access specifiers for constructors, and instantiation, Parameterized Constructor, Multiple Constructor in A Class, Constructor with Default Argument, Copy Constructor, Destructor

Unit-III

Unit-IV
Inheritance : Base Class Access Control, C, Protected Base Class Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors & Inheritance, When Constructor & Destructor Function are Executed, Passing Parameters to Base Class Constructors, Granting Access, Virtual Base Classes. Virtual Functions & Polymorphism : Virtual Function, Pure Virtual Functions, Early Vs. Late Binding

Unit-V

Books
**MCA-303 Theory of Computation**

**Unit-I**

**Review of Mathematical Preliminaries:** Set, Relations and functions, Graphs and trees, strings, alphabets and languages. Principle of induction, predicates and propositional calculus.

**Theoretical Automation:** Definition, description, DFA, NFA, Transition systems, 2DFA, equivalence of DFA & NDFA, Regular expressions, regular grammar, FSM with output (mealy and moore models), Minimization of finite automata.

**Unit-II**

**Formal Languages:** Definition & description, Phrase structured grammars & their classification, Chomsky classification of languages, closure properties of families of language, regular grammar, Regular set & their closure properties, finite automata, equivalence of FA and regular expression, Equivalence of two way finite automata, equivalence of regular expressions.

**Unit-III**

**Context-Free grammar & PDA:** Properties unrestricted grammar & their equivalence, derivation tree. Simplifying CFG, unambiguifying CFG, ε-productions, normal form for CFG, Pushdown automata, 2 Way PDA, relation of PDA with CFG, Determinism & Non determinism in PDA & related theorems, Parsing and pushdown automata.

**Unit-IV**

**Turing Machine:** Model, design, representation of TM, language accepted by TM, universal turing machine, determine & non-determinism in TM, TM as acceptor/generator/algorithms, multidimensional, Multitracks, multitape, Two way infinite tape, multihead, Halting problems of TM.

**Unit-V**

**Computability:** Concepts, Introduction to complexity theory, Introduction to undecidability, recursively Enumerable sets, primitive recursive functions, recursive set, partial recursive sets, concepts of linear Bounded Automata, context sensitive grammars & their equivalence

**Books**

MCA-304 Computer Networks

UNIT-I


UNIT-II


UNIT-III


UNIT-IV


UNIT-V


BOOKS:
2. Forouzan “Data Communication and Networking 3ed”, TMH
MCA-305 Operation Research

UNIT-I
Introduction of operation research. LP Formulations, Graphical method for solving LP’s with 2 variables, Simplex method, Duality theory in linear programming and applications, Integer linear programming, dual simplex method.

UNIT-II
Transportation problem, Assignment problem.

UNIT-III
Dynamic Programming: Basic Concepts, Bellman’s optimality principles, Dynamics programming approach in decision making problems, optimal subdivision problem.
Sequencing Models: Sequencing problem, Johnson’s Algorithm for processing n jobs through 2 machines, Algorithm for processing n jobs through 3 or more machines, Processing 2 jobs through n machines.

UNIT-IV
Project Management: PERT and CPM: Project management origin and use of PERT, origin and use of CPM, Applications of PERT and CPM, Project Network, Diagram representation, Critical path calculation by network analysis and critical path method (CPM), Determination of floats, Construction of time chart and resource labelling, Project cost curve and crashing in project management, Project Evaluation and review Technique (PERT).

UNIT-V
Inventory Models: Introduction to the inventory problem, Deterministic Models, The classical EOQ (Economic Order Quantity) model, Inventory models with deterministe demands(no shortage & shortage allowed), Inventory models with probabilistic demand, multiitem determinise models.

BOOKS