Scheme of Examination (MCA) w.e.f. 2011-12 Third Year			
CS-DE-31	Computer Architecture & Parallel Processing	100	40
CS-DE-32	Web Engineering	100	40
CS-DE-33	Visual Programming	100	40
CS-DE-34	Elective – I	100	40
CS-DE-35	Elective-II	100	40
CS-DE-36	Project Report	100	40
CS-DE-37	Software Lab – I HTML/XML/Java/Java Script/JSP	100	40
CS-DE-38	Software Lab – II Visual Programming	100	40
	Total Marks	**800**	
	Elective Papers		
CS-DE-34(i)	Microprocessor		
CS-DE-34(ii)	Data Mining and Warehousing		
CS-DE-34(iii)	Software Project Management		
CS-DE-34(iv)	Java Programming		
CS-DE-35(i)	Principles of Programming Languages		
CS-DE-35(ii)	Theory of Computation		
CS-DE-35(iii)	Internet Computing		
CS-DE-35(iv)	Linux and Shall Programming		

CS-DE-31 COMPUTER ARCHITECTURE AND PARALLEL PROCESSING

Maximum Marks: 100 **Minimum Pass Marks: 40**

Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Computer Arithmetic: Hardware implementation and algorithms for addition and subtraction with signed-magnitude data, signed 2's complement data, multiplication for signed-magnitude data, Booth multiplication algorithm, array multiplier, division for signed magnitude data, divide overflow. Hardware implementation and algorithms for floating point addition, subtraction, multiplication and division.

Control Design: Hardwired Control – classical method, one-hot method; Microprogrammed Control – basic concepts and structure of a microprogrammed control unit, horizontal versus vertical microinstruction formats, microinstruction addressing.

Computational Model: Basic computational models, evolution and interpretation of computer architecture, concept of computer architecture as a multilevel hierarchical framework. Classification of parallel architectures, Relationships between programming languages and parallel architectures

Parallel Processing: Types and levels of parallelism, Instruction Level Parallel (ILP) processors, dependencies between instructions, principle and general structure of pipelines, performance measures of pipeline, pipelined processing of integer, Boolean, load and store instructions, VLIW architecture, Code Scheduling for ILP-Processors - Basic block scheduling, loop scheduling, global scheduling

UNIT – II

Superscalar Processors: Emergence of superscalar processors, Tasks of superscalar processing – parallel decoding, superscalar instruction issue, shelving, register renaming, parallel execution, preserving sequential consistency of instruction execution and exception processing, comparison of VLIW & superscalar processors

Branch Handling: Branch problem, Approaches to branch handling – delayed branching, branch detection and prediction schemes, branch penalties and schemes to reduce them, multiway branches, guarded execution

Distributed Memory MIMD Architectures: Solution for memory and synchronization latency, direct interconnection networks, Multicomputer architectures

Shared Memory MIMD Architectures: Dynamic interconnection networks, cache coherence problem and H/W & S/W based protocols, UMA, NUMA, CC-NUMA & COMA models

Text Books:

1. M. Morris Mano, Computer System Architecture, PHI, 2001
2. Sima, Fountain, Kacsuk, Advanced Compter Architecture, Pearson Education, 1997

Reference Books:

1. J.P.Hayes, Computer Architecture and Organization"; MGH, 1998.
2. Harry F. Jordan, Gita Alaghband, Fundamentals of Parallel Processing, Pearson Education, 2003
3. D. A. Patterson and J. L. Hennessey, Computer Organization and Design, Morgan Kaufmann, 2002.
4. Hwang & Briggs, Computer Architecture and Parallel Processing, MGH, 1984

CS-DE-32 WEB ENGINEERING

Maximum Marks: 100 **Minimum Pass Marks: 40**
Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Role of Information Architect, Collaboration and Communication, Organizing Web Site parameters, Navigation Systems, Designing Search Interface for web-site, Conceptual Design, High-Level Design, Architectural Page Mockups, Design Sketches, good & bad web design, Process of Web Publishing, Phases of Web Site development, enhancing your web-site, web security.

HTML Basic Concepts, Static and dynamic HTML, Structure of HTML documents, HTML Elements, Linking in HTML, Anchor Attributes, Image Maps, Meta Information, Image Preliminaries, Layouts, Backgrounds, Colors and Text, Fonts, Tables, Frames and layers, Audio and Video Support with HTML, Database integration with HTML, CSS, Positioning with Style sheets. Forms Control, Form Elements.

UNIT – II

Introduction to CGI, PERL, URL, HTTP, Browser Requests, Server Responses, Proxies, Firewalls, CGI Environment Variables. Forms and CGI, Sending Data to the Server, Architectural Guidelines, Coding Guidelines, Efficiency and Optimization. Java Server Pages, Active Server Pages, Integrating Scripts in JSP, JSP Objects and Components, JSP: Request and response objects.

PHP, PHP variables, ASP .NET, Cookies, Creating and Reading Cookies, Relationship between HTML, SGML, and XML, XML Basics, XML for Data Files, Embedding XML into HTML documents, Converting XML to HTML and HTML to XML. Displaying XML using CSS and XSL, The future of XML.

Text-Books

1. Internet & World Wide Web How to Program, Pearson education, 3rd edition, by: H.M. Deitel, P.J. Deitel, A.B. Goldberg.
2. Web- Technologies, TCP/IP and Java Programming, McGraw-Hill Companies.

References-Books

1. Programming with World Wide Web, Pearson education, 4th edition, by: Sebesta.
2. Thomas A Powell, HTML-The Complete Reference, Tata McGraw Hill.
3. Scott Guelich, Shishir Gundavaram, Gunther Birzniek; CGI Programming with Perl 2/e. O'Reilly.
4. Doug Tidwell, James Snell, Pavel Kulchenko; Programming Web Services with SOAP, O'Reilly.

CS-DE-33 VISUAL PROGRAMMING

Maximum Marks: 100 **Minimum Pass Marks: 40**

Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Introduction to Visual Basic: VB IDE, An overview of VB project types, VB as event-driven & object-based language, Default controls in Tool Box

Programming with VB: Variables, Constants, Data types, Arithmetic operators, String Operations, Built-in function, I/O in VB, Branching & Looping statements, Procedures, Arrays, collection.

Menus and Dialog Boxes: Adding menus and manipulating, using Common Dialog Box

Working with Forms: Working with multiple forms, MDI form, loading, showing and hiding forms, drag and drop operation

Advanced Controls in VB: Scroll Bar, Slider Control, TreeView, List View, RichText Box Control, Toolbar, Status Bar, Progress Bar, Cool bar, Image List, Tab Strip.

UNIT – II

File Handling & File Controls: Working with sequential & random files, performing operations on a file

Working with Graphics: Using Paint, Line, Circle, RGB and other related method, manipulating graphics.

Using modules & class modules in VB

ActiveX: Creating & using ActiveX Controls, Creating & using ActiveX Documents, ActiveX EXE, and ActiveX DLL*

VB & Databases: The Data Controls and Data-Bound Controls, Using DAO, RDO, ADO.

Internet features: Creating & using a Web-Browser, Programming E-Mail, Using the Internet Transfer Control.

Creating & Using OLE.

Text Books:

1. Visual Basic 6 Programming : Black Book By Steven Holzner dreamtech PRESS
2. Mastering Visual Baisc 6 By Evangelos Petroutsos BPB
3. Programming in Visual Basic 6.0 By Julia Case Bradley & Anita C. Millspaugh Tata McGraw-Hill Edition

Reference Books:

1. Step by Step Microsoft Visual Basic 6.0 Professional By Michael Halvorson PHI
2. Visual basic 6 Complete BPB
3. Teach Yourself Visual basic 6 By Scott Warner Tata McGraw-Hill Edition
4. Using Visual Basic 6 Special Edition By Brian Siler and Jeff Spotts PHI

CS-DE-34(I) MICROPROCESSORS

Maximum Marks: 100 **Minimum Pass Marks: 40**
Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Microprocessor and Its Architecture: Internal microprocessor architecture, real mode memory addressing, protected memory addressing, memory paging. Data, Program Memory and Stack Memory addressing modes. 8086/8088 Microprocessors – pinouts and pin functions, clock generator (8284A), Bus buffering and latching, Bus timing, ready and wait state, minimum and maximum mode.

Memory Interface: Memory Devices, Address Decoding, 8-bit, 16-bit, 32-bit and 64-bit memory interfaces, Dynamic RAM.

Basic I/O Interface: I/O Interface, I/O Port Address Decoding, Programmable Peripheral Interface, 8279 Programmable Keyboard/Display Interface, 8254 Programmable Interval Timer, 16550 Programmable Communication Interface, RS232C, SCSI adapter.

UNIT – II

Interrupts: Basic Interrupt Processing, Hardware Interrupts, Expanding the Interrupt Structure, 8259A Programmable Interrupt Controller.

Direct Memory Access (DMA): Basic DMA Operations, 8237 DMA Controller, Shared Bus Operations.

Bus Interface: ISA, EISA, VESA Buses, PCI, USB Bus.

386, 486, Pentium, Pentium Pro Microprocessors and Pentium IV: Register Configuration & Memory Management, Introduction to Core 2 Duo & Quadcore Processors.

Text Books:

1. The Intel Microprocessors 8086/8088, 80186/80188,80286, 80386, 80486, Pentium, Pentium Pro Processors, Pentium II, Pentium III, Pentium 4 and Core2 with 64-bit Extensions: Architecture, Programming and Interfacing, Barry B. Brey, 8th Edition, Pearson Education-2009.

Reference Books:

1. The 80386, 80486, and Pentium Processors: Hardware, Software, and Interfacing, Walter Tribel, Prentice Hall, 1998, ISBN #0-13-533225-7
2. Microcomputer Systems: Architecture, Programming, and Design. By Liu and Gibson (PHI).

CS-DE-34(II) DATA WAREHOUSING AND DATA MINING

Maximum Marks: 100 **Minimum Pass Marks: 40**
Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Introduction: The Evolution of Data Warehousing (The Historical Context), The Data Warehouse - A Brief History, Characteristics, Operational Database Systems and Data Warehouse (OLTP & OLAP), Today's Development Environment, Data Marts, Metadata.
Multidimensional Data Models: Types of Data and their Uses, from Tables and Spreadsheets to Data Cubes, Identifying Facts and Dimensions, Designing Fact Tables, Designing Dimension Tables, Data Warehouse Schemas, OLAP Operations.
Principles Of Data Warehousing (Architecture And Design Techniques): System Processes, Data Warehousing Components, Architecture for a Data Warehouse, Three-tier Data Warehouse Architecture, Steps for the Design and Construction of Data Warehouses.
Implementation: Methods for the Implementation of Data Warehouse Systems.
Data Mining: Introduction: Motivation, Importance, Knowledge Discovery Process, KDD and Data Mining, Data Mining vs. Query Tools, Kind of Data, Functionalities, Interesting Patterns, Classification of Data Mining Systems, Major issues, From Data Warehousing to Data Mining.
Data Preparation: Preprocess, Data Cleaning, Data Integration and Transformation, Data Reduction.

UNIT – II

Data Mining Primitives, Languages, and System Architectures.
Concept Description: An Overview of Descriptive Data Mining, Predictive Data Mining, Methods for Concept Description.
Mining Association Rules: Association Rule Mining, Market Basket Analysis, Types of Association Rules, Methods for Mining Association Rules in Transaction Databases, Relational Databases and Data Warehouses.
Classification and Prediction: Methods for Data Classification and Prediction.
Cluster Analysis Introduction: Types of data in Cluster Analysis, A categorization of major Clustering Methods, Density-based methods, Grid-based methods, Model-based clustering methods, Outlier Analysis.
Applications of Data Mining.
Tools for Data Mining.

Reference Books:

1. J Hanes, M. Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann Publishers, 2002.
2. Glenn J. Myatt, "Making Sense of Data", Wiley 2007.
3. Adriaans, "Data Mining", Pearson Education.
4. Paolo Giudici, "Applied Data Mining – Statistical Methods for Business and Industry", Wiley 2003.

CS-DE-34(III) SOFTWARE PROJECT MANAGEMENT

Maximum Marks: 100 **Minimum Pass Marks: 40**
Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Software - characteristics-components - crisis on the horizon-software myths, software process, software process models-linear sequential model-prototyping model- RAD model-incremental, spiral, component, assembly and concurrent development models.

Project Management concept: Project, problems with software projects, activities covered by SPM.

Project schedule planning: Top down and bottom up planning, initial and final project schedule plans, types of activity relationships, estimating the duration of an activity, critical path, identifying milestones, activity responsibility matrix, project check list.

Project Tracking: Overview of project progress, project outlook, occurrence of tracking, tracking meetings, tracking meeting ground rules, recovery plans, the role of escalations.

UNIT – II

Software process and project metrics: - Metrics and indicators- metrics for software quality-integrating metrics within the software process. Software project planning: Planning objectives - software scope-resources software project estimation- Empirical estimation models-COCOMO model. Risk management: software risks-risk identification-risk projection-risk mitigation, monitoring and management- RMMM plan.

Project scheduling and tracking: Basic concepts-relation between people and effort, defining task set for the software project-selecting software engineering task-refinement of major task-defining a task network-scheduling-project plan. Software quality assurance-quality concepts-software reviews-formal technical review-Formal approaches to SQA - the ISO 9000 quality standards. Software configuration management: baselines-software configuration item-the SCM process identification of objects in software configuration-version control-change control configuration audit-status reporting-SCM standards.

Text Books:

1. Walker Royce, Software Project management: A unified framework , Pearson Education
2. Pankaj Jalote., Software Project management in practice, Pearson Education

References Books:

1. Kelkar, S.A., Software Project management: A concise study, PHI
2. Hughes Bob and Cottorell Mike, Software Project management – TMH.
3. Sommerville I, Software engineering , Addison Wesley
4. Robert Futrell, Donald F Shafer and Linda I, Quality software project management, Person Education
5. Pressman, R. S., Software Engineering, McGraw Hill International
6. Neal Whitten, 'Managing Software Development Projects, Formula for Success', John Wiley and sons, II edition, 1995.

7. Watts Humphrey, 'Managing the Software Process', Addison Wesley, 1989.

CS-DE-34(IV) JAVA PROGRAMMING

Maximum Marks: 100 **Minimum Pass Marks: 40**

Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Features of Java, Data types, operators & expressions, control structures, arrays, Class, objects & methods, constructors, garbage collection, access qualifiers, string handling – string operations, character extraction, string comparison, searching and modifying strings, StringBuffer, packages and interfaces, Wrapper classes.

Inheritance: single and multilevel inheritance, method overriding, abstract class, use of super and final keywords.

Exception Handling: Exception types, uncaught exceptions, multiple catch clauses, nested try statements, built-in exceptions, creating your own exceptions.

Multithreading: Java thread model, creating multiple threads, thread priorities, synchronization, interthread communication, suspending, resuming and stopping threads.

UNIT – II

Applets: Local & Remote Applets, Applet Architecture, Passing Parameters to Applets.

I/O Streams: Console I/O – reading console input, writing console output, Files I/O – Byte Streams, Character Streams.

Collection Interfaces & Classes, Delegation Event Model

AWT Classes: Window fundamentals, working with graphics, working with color & fonts. AWT controls, layout managers & menus

Swing Classes, Java Beans, Servlet classes & Life Cycle

Text Books:

1. The Complete Reference Java 2, Fourth Edition, Herbert Schildt, Tata McGraw Hill-2001
2. Introduction to Java Programming (7^{th} Edition), Liang Y.Daniel, 2009, Pearson Education.

Reference Books:

1. Java 1.2, Steven Holzner, BPB-1998
2. Programming with Java - E. Balaguruswami, Second Edition, Tata McGraw Hill-1998.
3. A Programmer's Guide to Java Certification, Mughal K.A., Rasmussen R.W., Addison-Wesley, 2000

CS-DE-35(I) PRINCIPLES OF PROGRAMMING LANGUAGES

Maximum Marks: 100 **Minimum Pass Marks: 40**

Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Preliminaries - language paradigms, language criteria, language design trade-offs, influences on language design, bindings, type checking, and scopes, variables and data types: primitive data types, variables, structured data types. Abstraction: data abstraction, control abstraction, procedural abstraction.

Formal languages and automata - The Chomsky hierarchy of formal languages, regular grammars, regular expressions, finite automata, Context-free grammars: pushdown automata, ambiguous grammars.

Imperative programming - structured programming, procedure activations: parameter passing methods, scope rules, and activation records.

UNIT – II

Object oriented programming - messages, methods and encapsulation, classes and polymorphism, inheritance and object orientation, design issues for object oriented languages.

Functional programming - Features of functional languages, implementing functional languages, applications of functional languages.

Logic programming - Formal logical systems, implementations and applications.

Languages for databases - manipulating relational databases using SQL.

Language constructs for parallel processing - the paradigm, multiple processes, synchronization of cooperating processes.

Text Books:

1. Pratt E. Terrence & Zelkowitz V. Marvin, Programming Languages – Design & Implementation, Prentice Hall of India.
2. Appleby Doris & VandeKopple J. Julius, Programming languages-Paradigm and practice 2nd ed. (Tata McGraw Hill - 1999)

Reference Books:

1. Sebesta W. Robert, Concepts of programming languages 4th ed.,(Addison Wesley - 2000)
2. Sethi Ravi, Programming languages 2nd ed. (Addison Wesley - 2000)

CS-DE-35(II) THEORY OF COMPUTATION

Maximum Marks: 100 **Minimum Pass Marks: 40**

Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Theory of Computation: Formal Language, Need for formal computational models, Non-computational problems, diagonal argument and Russel's paradox.

Deterministic Finite Automaton (DFA), Non-deterministic Finite Automaton (NFA), Regular Languages and regular sets, Equivalence of DFA and NFA, Kleen's characterization theory for sets accepted by finite automata, Minimizing the number of states of a DFA, Non-regular languages and pumping lemma.

UNIT – II

Pushdown Automaton (PDA), Deterministic Pushdown Automaton (DPDA), Non-equivalence of PDA and DPDA.

Context Free Grammars: Greibach Normal Form (GNF) and Chomsky Normal Form (CNF), Ambiguity, Parse Tree Representation of Derivations, Equivalence of PDA's and CFG's, Parsing techniques for parsing of general CFG's-Early's, Cook-Kassami-Younger (CKY), and Tomita's parsing.

Linear Bounded Automata (LBA): Power of LBA, Closure properties.

Turing Machine (TM), One tape, multitape, the notion of time and space complexity in terms of TM, construction of TM for simple problems, Computational complexity.

Chomsky Hierarchy of languages: Recursive and recursive-enumerable languages.

Reference Books:

1. Lewis, H.R. & Papadimitrious, C.H. Elements of the theory of computation. PHI
2. Salomma, A.K. Formal languages, Academic press.
3. Hopcroft, J. E. & Ullman, J. D. Formal languages and their relation to Automata Addison-Wasley
4. E. V. Krishnamurthy, Introductory theory of computer science East-West press Pvt. Ltd.
5. Zoha Mauna, Mathematical theory of computation, Wiley inter-science.
6. John Minsky, Theory of computation, PHI.
7. Greenberg M., Introduction to Automata Theory, Addison Wesley.

CS-DE-35(III) INTERNET COMPUTING

Maximum Marks: 100 **Minimum Pass Marks: 40**
Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Internet Architecture; Interconnection through IP Routers; End Systems, Clients, and Servers; Connectionless and Connection-Oriented Service; Access Networks; Growth of Internet; ISPs and Internet Backbone; Virtual circuit and datagram networks; Internetworking; TCP/IP Protocol Architecture; Operation of TCP and IP; process-to-process delivery; TCP services and features; TCP connection; TCP flow and congestion control; Connectionless Transport: UDP segment structure; UDP operation and uses; SCTP Services; SCTP Features and Packet Format;

Routers: Input Ports, Switching Fabric, Output Ports; Internet Protocol (IP); IPv4 addressing; fragmentation; Type of Service; Classful and Classless addressing; Subnetting and Supernetting; CIDR; Network Address Translation(NAT); IPv6 and its comparison with IPv4; Format and Headers of IPv6; Traffic class, Flow label, IPv6 addresses – Structure and Address Space; Transition from IPv4 to IPv6; Internet Control Message Protocol (ICMP):Types of Messages, Error Reporting, Query; IGMP: Group management, IGMP Messages, Message Format; IGMP operation;

Error Detection and Correction; Media Access Protocols; Sliding Window Protocols;

UNIT – II

Address mapping: Address Resolution Protocol (ARP), Reverse Address Resolution Protocol (RARP); Bootstrap protocol (BOOTP); Dynamic Host Configuration Protocol;

Routing: Routing Algorithms; Interior and Exterior routing protocols; Autonomous Systems; RIP; OSPF; BGP; Congestion Control Algorithms; Quality of Service;

Virtual-Circuit Networks: Frame Relay Networks, ATM Networks;

Network Management System; SNMP;

Network and Internet Security: Security services; cryptography; Message confidentiality with symmetric and asymmetric- key cryptography; Attacks and Countermeasures; Message Integrity: fingerprint, message digest, hash algorithms; Authentication; Digital Signature; Key management; Certificates; IPSec; SSL/TLS; PGP;

Multimedia: Multimedia Networking Applications; Streaming Stored Audio and Video; Audio and Video Compression; RTP; Voice over IP;

Text Books:

1. James F. Kurose, Keith W. Ross, Computer Networking, A Top-Down Approach Featuring the Internet, Pearson Education.
2. Behrouz A. Forouzan, Data Communications and Networking, Fourth Edition, McGraw Hill.

Reference Books:

1. Douglas E. Comer, Internetworking with TCP/IP Volume – I, Principles, Protocols, and Architectures, Fourth Edition, Pearson Education.
2. Mahbub Hassan, Raj Jain, High Performance TCP/IP Networking, Concepts, Issues, and Solutions, Pearson Education.
3. William Stallings, High-Speed Networks and Internets, Performance and Quality of Service, Pearson Education.
4. Andrew S. Tanenbaum, "Computer Networks", Pearson Education.
5. Wayne Tomasi, "Introduction to Data Communications and Networking", Pearson Education.

CS-DE-35(IV) LINUX & SHELL PROGRAMMING

Maximum Marks: 100 **Minimum Pass Marks: 40**
Time: 3 hours

Note: Examiner will be required to set TEN questions in all selecting FIVE questions from each unit. Students will be required to attempt FIVE questions in all selecting at least two questions from each unit. All questions will carry equal marks.

UNIT – I

Introduction to Linux: Linux distributions, Linux/Unix operating system, Linux/Unix architecture, Features of Linux/Unix, Accessing Linux system, Starting and shutting down system, Logging in and Logging out

Commands in Linux: General-Purpose commands, File oriented commands, directory oriented commands, Communication-oriented commands, process oriented commands, etc.

Regular expressions & Filters in Linux: Simple filters viz. more, wc, diff, sort, uniq, etc., grep, sed. introducing regular expressions.

Linux/Unix file system: Linux/Unix files, inodes and structure and file system, file system components, standard file system, file system types, file system mounting and unmounting.

Processes in Linux : starting and stopping processes, initialization Processes, mechanism of process creation, rc and init files, job control - at, batch, cron, time, Signal handling.

UNIT – II

Shell Programming: vi editor, shell variables, I/O in shell, control structures, loops, subprograms, creating shell scripts.

Basic system administration in Linux/Unix.

The C Environment

The C compiler, compiler options, managing projects, memory management, use of makefiles, dependency calculations, memory management - dynamic and static memory, building and using static and dynamic libraries, using ldd, soname, dynamic loader, debugging with gdb.

Text Books:

1. John Goerzen: Linux Programming Bible, IDG Books, New Delhi.
2. Sumitabha Das: Your Unix - The Ultimate Guide, TMH.
3. Richard Petersen: The Complete Reference – Linux, McGraw-Hill
4. Yashwant Kanetkar: Unix & Shell programming - BPB

Reference Books:

1. M.G.Venkateshmurthy: Introduction to Unix & Shell Programming, Pearson Education
2. Stephen Prata: Advanced UNIX-A programmer's Guide, SAMS

CS-DE-36 Project Report

Maximum Marks: 100 (Evaluation: 50 Viva-Voce: 50)
(Pass Marks: 20 Pass Marks: 20)

In this paper, the students have to take up a case study relating to a real world entity such as Library, Hospital, Hotel, Company, College, University etc.. They have to prepare a project report consisting of the following components:

Format of the student project report on completion of the project

(1) Cover Page: It should be as per format and the project title should be simple and understandable such as "Computerization of Inventory Management System for ABC Company".

(2) Self Certificate from the candidate: As per format.

(3) Certificate from the guide: As per format.

(4) Acknowledgement: In the "Acknowledgement" page, the writer recognizes his indebtedness for guidance and assistance of the thesis guide and other members of the faculty/company. Courtesy demands that he also recognizes specific contributions by other persons or institutions such as libraries and research foundations. Acknowledgements should be expressed simply, tastefully, and tactfully.

(5) List of abbreviations, Figures, Tables

(6) Table of Contents

(7) Objective & Scope of the Project: Write 8-10 pages introduction of the project. It should also include objectives, scope of work, tools and environment, s/w development life cycle used.

(8) System Analysis: Write about how you collected and captured user's requirements for the project undertaken by you. Mention which existing methodology you used to collect the user's requirements.

(9) Design: Explain the high-level and low level design of the system you are developing.

(10) Implementation & Testing: Implement the design by using appropriate platform. Write various types of test strategies used by you. Write various test cases prepared by you.

(11) Conclusion & Future scope: Conclude your project in this component and mention possible future extensions to your project.

(12) Bibliography/References: Give details of reference books, website, journals etc. used.

List of Sample Projects:

a) Library Management System (VB/Oracle, ASP/Access)
b) Hospital Management System (VB/Oracle, ASP/Access)
c) Inventory Management System (VB/Oracle)
d) Pathology Report generation (C++, VB, ASP, Java)
e) Encryption/Decryption for Email (VB, C++, VC++, Java)
f) Student/Teacher Collaboration (ASP, Java servlets)
g) Personal Income Tax Planner (ASP, Jscript, Java, VB, C++)
h) Banking System (VB/Oracle)
i) Trader sales register (VB/Oracle, ASP/Access, SQL-Server)
j) Airlines Boarding Pass System (VB/Oracle, ASP, C++)
k) Pre-Paid Taxi Management System (C++, VB, ASP, Jscript)
l) Menu-Recipe Management system (C++, VB, ASP)
m) Editor for a Unix Text Terminal (C++)
n) Departmental Document Management System (PERL, C++)
o) Automatic Stock Trigger Warning System (VB/Oracle, ASP Access etc.)
p) Etc.

Guidelines for Preparing Project Report

The following guidelines must be followed in preparing the Final project Report:

Good quality white executive bond paper A4 size should be used for typing and duplication. Care should be taken to avoid smudging while duplicating the copies.

Page Specification: (Written paper and source code)

Left margin – 1.25"

Right margin – 1.25"

Top margin – 1"

Bottom margin – 1"

Page numbers - All text pages as well as Program source code listing should be numbered at the bottom center of the pages.

Normal Body Text: Font Size: 12, Times New Roman, 1½ Spacing, Justified. 6 point above and below para spacing

Paragraph Heading: Font Size**:** 14, Times New Roman, Underlined, Left Aligned. 6 point above & below spacing.

Chapter Heading: Font Size: 18, Times New Roman, Centre Aligned, 12 point above and below spacing.

Coding: Font size**:** 10, Courier New, Normal

Binding: Project Report should be typed on both sides of the page and binding of the Project Report should be with Art paper.

Submission of Project Report to the University: The student will submit two **hard Copy of** his/her project report in the prescribed format.

Declaration from the student

I, <*Student Name*>, a student of Master of Computer Applications (MCA), in the Directorate of Distance Education, Kurukshetra University, Kurukshetra, under Roll No.------, for the session ----------, hereby, declare that the project entitled "*Title of the Project"* has been completed by me under the supervision of <*Guide name*>.

The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief.

Date: **(*Student Name*)**

Certificate from the Guide

It is certified that Mr./Ms.<*Student Name*>, a student of Master of Computer Applications (MCA) in the Directorate of Distance Education, Kurukshetra University, Kurukshetra, under Roll No.------ for the session …....., has completed the project entitled <*Title of the project*> under my supervision. .

(*Guide Name*)

A

Project Report

On

<PROJECT TITLE>

Submitted in the partial fulfillment of the requirement

for the award of degree of

Master of Computer Applications

(Session:)

Supervised By:

<Name of Guide>

<Official address>

Submitted By:

<Student Name>

Examination Roll No.

DDE Reference No.

Directorate of Distance Education