PANJAB UNIVERSITY, CHANDIGARH-160014 (INDIA)

OUTLINES OF TESTS SYLLABI AND COURSES OF READING

FOR

Bachelor of Vocation (SOFTWARE DEVELOPMENT)

Session 2018-19

(1st to 6th Semester)

SCHEME OF B.Voc. (SOFTWARE DEVELOPMENT)
(SEMESTER SYSTEM)

Semester I

Paper Code	Title	Generic/ Skill Component	Theory/ Practical	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical)	Credit
*GEN -101	Communication Skills	Generic	Theory	20	80	--	--	6
*GEN -102	Fundamentals of Information Technology I	Generic	Theory	20	80	--	--	6
SD 103	Logic Development Techniques	Skill Component	Theory & Practical	20	80	--	--	6
SD 104	Fundamental of Information Technology II	Skill Component	Theory & Practical	10	40	10	40	6
SD 105	Internet Application	Skill Component	Practical	--	--	20	80	6

SEMESTER II

*GEN 201	Soft Skills and Personality Development	Generic	Theory	20	80	--	--	6
SD 108	Relational Database Management System	Generic	Theory	20	80	--	--	6
SD 109	RDBMS using MySQL	Skill Component	Theory & Practical	20	80	--	--	6
SD 110	Programming in C Language	Skill Component	Theory & Practical	10	40	10	40	6
SD 111	PC maintenance and trouble shooting	Skill Component	Practical	--	--	20	80	6
**SIT-201	Summer Industrial Training	Skill	Practical	--	--	20	80	6

***Refer to Generic Components Common to all B.Voc. Courses**

** **Summer Industrial Training of 4-6 weeks in a relevant Industry after 2nd Semester Examinations during summer break. Training report by the student to be submitted within in one week of start of 3rd Semester. Viva-Voce examination to be held within 3-weeks of the start of 3rd semester.**

Job Role: ----Data Entry operator, IT Help Desk, Office Executive, Software Trainee, Technical Support Voice, B.P.O, Lab Technician, Database Administrator, Network Administrator, Application Programmer

Semester III								
Paper Code	**Title**	**Generic/ Skill Component**	**Theory/ Practical**	**Internal (Theory)**	**External (Theory)**	**Internal (Practical)**	**External (Practical)**	**Credit**
*GEN 301	Value Education And Human Rights	Generic	Theory	20	80	--	--	6
SD 202	Mathematical Tools for Computer Science.	Generic	Theory	20	80	--	--	6
SD 203	Object Oriented Programming using C++	Skill Component	Theory & Practical	20	80	--	--	6
SD 204	Data Structure using C++	Skill Component	Theory & Practical	10	40	10	40	6
SD 205	Data communication and networks	Skill Component	Practical	--	--	20	80	6
SEMESTER IV								
*GEN 401	Environmental Studies	Generic	Theory	20	80	--	--	6
SD 208	Operating System	Generic	Theory	20	80	--	--	6
SD 209	Web Programming	Skill Component	Theory & Practical	20	80	--	--	6
SD 210	JAVA Programming	Skill Component	Theory & Practical	10	40	10	40	6
SD 211	Computer based accounting	Skill Component	Practical	--	--	20	80	6
**SIT-401	Summer Industrial Training	Skill	Practical	--	--	20	80	6

***Refer to Generic Components Common to all B.Voc. Courses**

** **Summer Industrial Training of 4-6 weeks in a relevant Industry after 4th Semester Examinations during summer break. Training report by the student to be submitted within in one week of start of 5th Semester. Viva-Voce examination to be held within 3-weeks of the start of 5th semester.**

Job Role: -----Technology and Information systems operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer

B.Voc. (Software & Development)

Semester V

Paper Code	Title	Generic/ Skill Component	Theory/ Practical	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical)	Credit
*GEN - 501	Critical Thinking and Elementary Statistics	Generic	Theory	20	80	--	--	6
SD 302	Software engineering and quality assurance	Generic	Theory	20	80	--	--	6
SD 303	Computer graphics and Multimedia Applications	Skill Component	Theory & Practical	20	80	--	--	6
SD 304	ASP.NET using C#	Skill Component	Theory & Practical	10	40	10	40	6
SD 305	Linux operating System	Skill Component	Practical			20	80	6

Note: Winter Industrial/ In-house Training of 2-3 weeks in a relevant area after 5th Semester Examinations in winter break.

SEMESTER VI

*GEN 601	Entrepreneurship Development Programme	Generic	Theory	20	80	--	--	6
SD 308	E- Commerce	Generic	Theory	20	80	--	--	6
SD 309	Emerging Technologies in Computing	Skill Component	Theory & Practical	20	80	--	--	6
SD 310	Network Management	Skill Component	Theory & Practical	10	40	10	40	6
SD 311	PHP Programming	Skill Component	Practical			20	80	6
**SIT-601	Summer Industrial/ In-house Training and Comprehensive Viva	Skill	Practical	--	--	20	80	6

***Refer to Generic Components Common to all B.Voc. Courses**

****Winter Industrial/ In-house Training of 2-3 weeks done after 5th Semester Examinations and before start of 6th semester. Training report by the student to be submitted within in one week of start of 6th Semester. Viva-Voce examination to be held within 3-weeks of the start of 6th semester.**

Job Role: ----Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer

Paper Title: Logic Development Techniques
Paper Code: SD103 **Credits: 06**

Job Roles:
Data Entry operator, IT Help Desk, Office Executive, Software Trainee, Technical Support Voice, B.P.O, Lab Technician, Database Administrator, Network Administrator, Application Programmer

Objectives:

1. To develop the logic of the different problems.
2. To equip students with the basic knowledge of logic development techniques.
3. To enhance the skills of students for software development.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT - I

Logic Development Tools: Algorithm Development: Types of Algorithm, Algorithm of Analysis, Advantage and Disadvantage of Algorithm, Complexity of Algorithm, Big-O Notation. **Flowchart:** Types of Flowcharts, Advantage and Disadvantage of Flowchart, Designing Pseudo code, Decision table, Steps for problem solving, Stepwise refinement, Modular Programming: top down & bottom up approach.

Unit II

System Analysis and Design: Definition of problem, Feasibility study, Requirement analysis, Designing, Coding, Testing and Implementation of software project.

UNIT - III

Basics of Programming Language Usage of Character Set, Meaning of Keywords and Identifiers, Role of Data Types, Constants and Variables. Importance of type Casting. Different Types of Operators and their Precedence, Expressions, Conditional Statements

Unit IV

Control Statements: Decision Making statements (if, if-else, else if, nested if), Looping Statements (For, While, do-while), Usage of Exit, Continue, Break and Goto Statement. Introduction of array and functions.

References Resources:

1. Let us C, Yashvant P Kanetkar, Seventh Edition, BPB Publications, New Delhi.
2. Programming in ANSI C, E. Balagurusami, Fourth Edition, Tata McGraw Hill
3. Learn Programming in C, Anshuman Sharma, Lakhanpal Publisher
4. The C Programming Language, Kernighan & Richie, Second Edition, PHI Publication
5. Problem Solving and Programming in C, R. S. Salaria, Second Edition
6. System Analysis and Design , Elias M awad

B.Voc. (Software & Development)

Semester : I

Paper Title: Fundamentals of Information Technology II

Paper Code: SD104 **Credits: 06**

Job Role: *Data Entry operator, IT Help Desk, Office Executive, Software Trainee, Technical Support Voice, B.P.O, Lab Technician, Database Administrator, Network Administrator, Application Programmer*

Objectives:

1. To familiarize the students with the Fundamentals of Information Technology and its applications.
2. To use computer systems at operating system level and application level.

3. To assess the implications for the markets and organizational change of advances in information technologies

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit I

Operating Systems- Windows and Unix. Fundamentals of windows, anatomy of windows, Operations on window: Opening, Minimizing, Maximizing, Moving, Resizing, Closing; Windows Explorer, Folders: Creating, deleting, copying, renaming folders, folder properties; Icons, Menu, Taskbar, Control panel, Recycle bin. Overview of UNIX structure, general purpose UNIX commands such as date, echo, cal, bc, pwd, passwd; file and directory commands such as ls,

mkdir, cp, mv, rm. process management commands such as ps, kill, nohup, communication commands such as news, mesg, wall; working with editor introduction to shell programming

Unit II

Word Processing Package: Basics of Word Processing; Word Processing Basics; Text creation, Manipulation, Finding and replacing, Formatting of text; Printing of word document, Page Layout: Margin setting, Alignments, Adding Borders and shading, Adding Headers and Footers, Setting up Multiple columns, Working with tables, Spell check, Auto Correct, Grammar facility, Retrieving often used text; Auto text character formatting, language setting and thesaurus; Macros; Mail merge.

Unit III

Spreadsheet Package: Worksheet Basics, Data Entry in Cells: Entry of numbers, text and formulae, Moving data in a worksheet, Moving around in a worksheet, Selecting Data Range. Using the interface (Toolbars, Menus), Editing Basics, Working with workbooks, Cell referencing: Absolute, Relative and Mixed; Formatting and Calculations :using Autofill,

Working with Formulae, Efficient Data Display with Data formatting (number formatting, date formatting etc.), Function: different types of functions and their usage Worksheet Printing. Working with Graphs and Charts: Creating Chart and graphs, using chart wizard, sizing and moving parts, updating charts, Changing chart types, Formatting Charts. Database Management; Finding records with Data form, Adding/Deleting Records, Filtering Records in a worksheet, Sorting; Macros: Creating Macros, Record Macros, Running Macros, Assigning Macros to Buttons.

Unit IV

Presentation Packages: Basics, General Features, Creating a presentation, Different types of slide views, Master Slides and its use, Formatting Slides: slide design, Layout and background; Animation effect, Transition effect, timing effects, Macros.

Database Package: Introduction to Database, Tables, Data Types, Attributes, Records; Overview of MS-ACCESS, Creating Database, Creating Tables, Data types, Importing and Exporting data, using Wizards, Creating forms and queries.

References Resources:

1. Sinha, P.K.: Computer Fundamentals
2. Rajaraman, V.: Fundamentals of Computers.
3. Mathur Rajiv: DOS 6.2 Quick Reference, Galgotia.
4. Anshuman Sharma: Fundamentals of Information Technology, Lakhanpal Publisher
5. Texali, R.K.: PC Software made simple, Tata McGraw Hill.

B.Voc. (Software & Development)
Semester : I

Paper Title: Internet Application
Paper Code: SD105 **Credits: 06**

Job Roles:

Data Entry operator, IT Help Desk, Office Executive, Software Trainee, Technical Support Voice, B.P.O, Lab Technician, Database Administrator, Network Administrator, Application Programmer

Objectives:

1. To analyze the performance of an Internet application protocol and its relation to the underlying network protocols.
2. To promote educational applications of the Internet technology for the benefit of government, colleges, polytechnics, universities and other educational institutions, industry and the public at large**.**

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT – I

Internet and Intranet: Introduction, History, Services of internet, working of internet, intranet, working of intranet, difference between internet and intranet**.**
E–Mail: Concept, Advantage and disadvantage, structure of an E–Mail message, working of E–Mail (sending and receiving messages), managing E–Mail, and Implementation of outlook express.

UNIT - II

Internet Protocol: Introduction, File Transfer Protocol (FTP), Gopher, Telnet, other protocols Like HTTP and TCP/IP.
WWW: Introduction, working of WWW, Web.

UNIT - III

Search Engine: Introduction to search engine, component of search engine, working of search engine, Web directory, difference between search engine and web directory.

UNIT - IV

News Group: Basic concepts of newsgroup. Online transactions like billing system, electronic commerce.

References Resources::

1. Internet and its Applications by Ackerman.
2. Anshuman Sharma:Fundamentals of Internet Applications, Lakhanpal Publisher
3. Computer Networks (5th Edition) Hardcover by Andrew S. Tanenbaum (Author), David J. Wetherall
4. Data Communications and Networking by Behrouz A. Forouzan

B.Voc. (Software & Development)
Semester: II
Paper Title: Relational Database Management System
Paper Code: SD108 **Credits: 06**

Job Roles: *Data Entry operator, IT Help Desk, Office Executive, Software Trainee, Technical Support Voice, B.P.O, Lab Technician, Database Administrator, Network Administrator, Application Programmer*

Objectives:

1. To provide good understanding of database design, modelling and implementation of database management systems.
2. To educate students with the fundamental concepts of Data Base Design, Data Models and different Data Base Languages.
3. To make access to the data easy for the user.

Unit I

Introduction: Database vs. File Oriented Approach, Advantages and Disadvantages of DBMS, Data models: Hierarchical, Network and Relational models.

Unit II

Entity Relationship model, Client-Server Architecture, Data Independence. Concept of Relational Algebra and Calculus, Storage Organization for Relations,

Unit III

Relational Algebra: Operations - union, intersection, difference, Cartesian product, projection, selection, division and relational algebra queries; Relational Calculus: Tuple oriented and domain oriented relational calculus and its operations, Normalization and its forms.

Unit IV

Database Integrity, Security, Concurrency, Backup and Recovery of the database. Design and structure of Distributed databases

References Resources::

1. An Introduction to Database System, Galgotia Publications By Desia,B.C
2. Database System Vol I & II, Narosa Publications By Date, C.J
3. Fundamentals of DBMS, Lakhanpal Publisher ,By Anshuman Sharma
4. Database System Concepts, McGraw Hill By Henry F. Korth

B.Voc. (Software & Development)
Semester : II

Paper Title: RDBMS using MySQL
Paper Code: SD109 **Credits: 06**

Job Roles: *Data Entry operator, IT Help Desk, Office Executive, Software Trainee, Technical Support Voice, B.P.O, Lab Technician, Database Administrator, Network Administrator, Application Programmer*

Objectives:

1. To introduce principles and foundations of databases, including architecture, design issues, integrity control, query processing and optimization, transactions, and concurrency control.
2. To design and implement database for enterprise application.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT I

Database Fundamentals: What is a database? What is MySQL? , Introduction to MySQL & MySQL workbench.

Database Design: Introduction To Database Design, Learn Database Normalization with the help of a case study, Learn ER Modelling with a Case Study

UNIT II

MySQL Basics: How To Create A Database & MySQL Data Types, How to use SELECT in MySQL, How to query data using Where clause in MySQL, How to use Insert Into in MySQL, How to Delete & Update data in MySQL

Data Sorting: How sorting is done in MySQL, using ORDER BY, DESC and ASC, How to use Group By in MySQL, How to use Wildcards in MySQL, Using Regular Expressions & Wild Cards in MySQL

UNIT III

Functions: Ultimate guide to Functions used in PHP, How to use Aggregate Function in MySQL, All about Null value & Keyword in MySQL, How to use Auto Increment in MySQL, How to use Alter, Drop & Rename function in MySQL, How to use Limit keyword in MySQL

UNIT IV

Queries: Using Sub-Queries in MySQL, How to use Joins in MySQL, How to use Unions in MySQL, How to use Views in MySQL, How to use Index in MySQL **Minor Application Design:** Creating an Application using MySQL

References Resources::

1. An Introduction to Database System, Galgotia Publications By Desai
2. Database System Concepts, McGraw Hill By Henry F. Korth
3. C.J. Date, A. Kannan, S. Swamynathan,“ An Introduction to Database system”, Pearson.
4. Dr. Madhulika Jain,Vinita Pillai, Shashi Singh and Satish Jain, “Introduction to Database Management”, BPB.
5. High Performance MySQL: Optimization, Backups, Replication, and More2nd Edition by Baron Schwartz (Author), Peter Zaitsev (Author),
6. MySQL in a Nutshell (In a Nutshell (O'Reilly)) 2nd Edition by Russell J. T. Dyer.

B.Voc. (Software & Development)
Semester : II

Paper Title: Programming in C Language
Paper Code: SD110 **Credits: 06**

Job Roles: *Data Entry operator, IT Help Desk, Office Executive, Software Trainee, Technical Support Voice, B.P.O, Lab Technician, Database Administrator, Network Administrator, Application Programmer*

Objectives:

1. To help the students in finding solutions to the various real life problems and converting the solutions into computer program using C.
2. To acquire knowledge about the basic concept of writing a program.
3. To learn and acquire the art of computer programming.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit I

Fundamental of 'C': Problem Solving steps, Structure of C Program, **I**/O statements, assignment statements, C character Set, Variables, Operators and Expressions, Standards and Formatted statements, Keywords, Data Types and Identifiers.

Control Structures: Introduction, Decision making with if – statement, if-else and Nested if, while and do-while, for loop. Jump statements: break, continue, goto, switch Statement.

Unit II

Functions: Function Declaration and Definition, types of functions, Call by value and Call by reference, Recursion, Pre-processor Directives.

Unit III

Preprocessor Directives: Introduction and Use, Macros, Conditional Preprocessors and Header Files.

Arrays: Introduction, Types, Operations on Arrays.

Pointers: Introduction, declaration, initialization, pointers and arrays

UNIT IV

Structure and Union: Declaring of structure, accessing structure members, Array of structure, nested of structure, Unions.

Files: introduction, creating, opening of data files, closing a data file and file handling functions.

References Resources::

1. Let us C, Yashvant P Kanetkar, Seventh Edition, BPB Publications, New Delhi. Programming in ANSI C, E. Balagurusami, Fourth Edition, Tata McGraw Hill
2. Programming in C, Byron S. Gottfried, Second Edition, McGraw Hills.
3. Learn Programming in C, Anshuman Sharma, Lakhanpal Publisher
4. Problem Solving and Programming in C, R. S. Salaria, Second Edition

B.Voc. (Software & Development)
Semester : II
Paper Title: PC Maintenance & Trouble shooting
Paper Code: SD111 **Credits: 06**

Job Roles: *Data Entry operator, IT Help Desk, Office Executive, Software Trainee, Technical Support Voice, B.P.O, Lab Technician, Database Administrator, Network Administrator, Application Programmer*

Objectives:

1. To equip the students with the knowledge of hardware maintenance, Software installation and handling troubleshooting.
2. To enhance the basic hardware skills of the students.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit-I

Troubleshooting General PC Problems: Introduction, General Troubleshooting rules, Common Problems & Solutions, Preventive Maintenance.

BIOS: Typical Motherboard BIOS, BIOS Features, BIOS & Boot Sequences, BIOS Shortcoming & Compatible Issues, BIOS Troubleshooting, BIOS Upgrades.

Unit-II

Hard Disk: Introduction, Disk Basics, Disk Performance & Characteristics, Drive, Construction, Drive Testing & troubleshooting.

Motherboard & Buses: Introduction, Motherboard Components, Expansion Slots system Bus Functions & Features. Upgrading & Troubleshooting Motherboard, General Bus Troubleshooting.

Unit-III

Basic Memory Concepts: Introduction, Installing Memories, Upgrade Options & Strategies, Replacing Memories with Higher Capacity. Troubleshooting Memory.

Unit-IV

Printers: Printer Technology, How Printer Works, Attaching Printer, Installing Printer Drivers, Preventive Maintenance, Common Printer Problems & Solution

Error Code: Beep Code, Post Code, Post Reader Card.

References Resources::

1. Upgrading & Repairing PCs: Muller – Prentice Hall – 10th Edition.
2. Complete PC Upgrade & Maintenance 32Guide: Mark Minasi–BPB Publishers–15th Edition.

B.Voc. (Software & Development)
Semester : II

Paper Title: Summer Industrial Training
Paper Code: SIT-201 **Credits: 06**

Job Roles: *Data Entry operator, IT Help Desk, Office Executive, Software Trainee, Technical Support Voice, B.P.O, Lab Technician, Database Administrator, Network Administrator, Application Programmer*

At the end of the semester, students should compulsorily undergo two week industrial training and the relevant certificate and project report has to be submitted.

The report should consist of the following:

1. Cover page including project title, name of the student, name of department and project guide.
2. Acknowledgements
3. Contents with page number
4. Introduction and background of the application Objectives
5. System analysis
6. System feasibility study
7. Further scope of the project Bibliography
8. Appendices

B.Voc. (Software & Development)

Semester : III

Paper Title: Mathematical Tools for Computer Science

Paper Code: SD202 **Credits: 06**

Job Roles: *Information and system operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer.*

Objectives:

1. To develop arithmetic, algebraic, geometric, and problem-solving skills.
2. To apply problem solving and logical skills.
3. To make the students familiar with several subfields of mathematics (e.g. numerical analysis, topology, operations research).

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit I

Sets and Relations:- Definition of sets, subsets, complement of a set, universal set, intersection and union of sets, De-Morgan's laws, Cartesian products, Equivalent sets, Countable and uncountable sets, minset, Partitions of sets. **Relations**: Basic definitions, graphs of relations, properties of relations.

Unit II

Matrix:- Introduction, Different kinds, matrix addition and scalar multiplication, multiplication of matrices, transpose etc. Square matrices, inverse and rank of a square matrix, differentiation and Integration.

Unit III

Numerical Methods: Solving simultaneous equations using Gauss elimination, Gauss Jordan Methods, Matrix Inversion method.

Unit IV

Linear Programming:- Graphical and Simplex method, Duality in Linear programming, Transportation problems, Assignment and travelling salesman problem.

References Resources::

1. Hiller, F.S & Liberman,G.J: Introduction To Operations Research, 2nd Edition Holden Day Inc London.
2. Schaum Series: Theory and Problems of Essential Computer Mathematics, Mc Graw Hill, New York, 3rd Edition.
3. Salaria, R.S: Computer Oriented Numerical Methods, Khanna Book Publishing Co (P) Ltd, New Delhi.
4. Liu, C. L.: Elements of Discrete Mathematics, McGraw Hill.

B.Voc. (Software & Development)
Semester : III

Paper Title: Object oriented programming using C++
Paper Code: SD203 **Credits: 06**

Job Roles: *Information and systems operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer.*

Objectives:

1. To help the students gain a better understanding of OO design and program implementation by using OO language features.
2. To make students learn various concepts of object oriented approach towards problem solving.
3. To introduce different techniques pertaining problem solving skills..

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit I

Concepts of Object Oriented Programming: Introduction to OOP, Difference between OOP and Procedure Oriented Programming, Object, Class, Encapsulation, Data Hiding, Abstraction, Polymorphism, Inheritance. Analysis and design of system using Object Oriented Approach, Structure of a C++ Program and I/O streams.

Unit II

Classes: Class declaration: Data Members, Member Functions, Private and Public Members, Data Hiding and Encapsulation, Arrays within a class.

Objects: Creating objects, Accessing class data members, Accessing member functions, Array of objects, Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects.

Constructors and Destructors: Constructors: Declaration and Definition, Default Constructors, Parameterized Constructor, Copy Constructor and Destructors.

Unit III

Polymorphism: Classification, static and dynamic polymorphism, virtual functions, pure virtual functions.

Function Overloading and Operator Overloading: Function Overloading: Declaration and definition. Operator Overloading: Overloading unary, binary, arithmetic, relational operators, Operator Overloading using friend function.

Unit-IV

Inheritance: Extending classes: Concept of Inheritance, base class, derived class, defining derived classes, visibility modes, private, public and protected

References Resources::

1. Anshuman Sharma : Learn Programming in C++, Lakhanpal Publisher.
2. E. Balaguruswamy : Object Oriented Programming with C++, TMH.
3. Bjarne Stroustrup : The C++ Programming Language, Addison Wesley.
4. Robert Lafore : OOP in Turbo C++,Galgotia.
5. Herbert Schildt : C++ The Complete Reference, TMH

B.Voc. (Software & Development)
Semester : III

Paper Title: Data structure using C++
Paper Code: SD 204 **Credits: 06**

Job Roles: *Information and system operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer.*

Objectives:

1. To teach students various data structures and explain to them algorithms for performing various operations on these data structures.
2. To use various data structures effectively in application programs.
3. To determine which algorithm or data structure to be used in different scenarios.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit I

Introduction of Data Structure: Definition of Data Structure, types of Data Structure. Operations on data structure.

Arrays: Linear and multi-dimensional arrays and their representation, operations on arrays.
Sorting and searching in array.

Unit II

Stacks & Queues: Definition of stacks Sequential and linked representations, operations on stacks, Queues: Sequential representation of queue, linear queue, circular queue, operations on linear and circular queue, linked representation of a queue and operations on it, priority queue.

Linked List: Linear linked list, operations on linear linked list, doubly linked list, operations on doubly linked list.

Unit III

Trees: Inserting a node, deleting a node, AVL trees, Heap Trees Practical implementation.

Unit IV

Graphs: Traversal of a graph (breadth-first search and depth-first search), and applications of graphs.

References Resources::

1. Lipschuitz L. Seymour: Data Structure, Schaum Outline Series, TMH, New Delhi.
2. Sharma Anshuman : Data Structures Using C++, Lakhanpal Publishers.
3. Salaria, R. S: Test Your Skills in Data Structures; Khanna Book Publishing Co. (P.) Ltd., New Delhi.
4. Sofat Sanjeev: Data Structure with C and C++, Khanna Book Publishing Co.

B.Voc. (Software & Development)
Semester : III
Paper Title: Data Communications and Networks
Paper Code: SD 205 **Credits: 06**

Job Roles: *Information and system operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer.*

Objectives:

1. To explain the importance of data communications and the Internet in supporting business communications and daily activities.
2. To analyze the services and features of the various layers of data networks.
3. To explain the role of protocols in networking.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit I

Introduction:- Data Communication, Network, Data Transmission, Transmission Modes, Network Hardware & Software, Network Topologies, OSI reference model, TCP/IP reference model.
Physical Layer:- Transmission Media, Switching, Multiplexing, Modem..

Unit II

Data Link Layer:- Design Issues, Framing, Error detection & Correction Codes, Flow Control (Stop & Wait, Sliding Window), Error Control, SLIP (Serial Line IP) & PPP(Point to Point).

Unit III

Network Layer:- Design Issues, IPv4 & IPv6 addressing, Routing Algorithms, Congestion control algorithms, Internetworking, Fragmentation, Firewalls.

Unit-IV

Application Layer:- Network Security Threats & Security Services. Cryptography and its algorithms, Message Integrity, Message Authentication, Digital Signatures, HTTP vs HTTPs, Proxy Server, Remote Login and File Transfer.

References Resources::

1. Computer Networks, Pearson Education by Andrew S. Tanenbaum
2. Data Communication & Networking, Tata McGraw Hill. By Behrouz A. Forouzan.
3. Data Communication & Networks, Kalyani Publishers by Charanjeet Singh
4. Data Communication & Computer Networks, ABS Publications by Anand Nayyar

B.Voc. (Software & Development)
Semester : IV

Paper Title: Operating System
Paper Code: SD 208 **Credits: 06**

Job Roles: *Technology and Information systems operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer.*

Objectives:

1. To introduce students with the basic concepts of Operating System, its functions and services.
2. To make students understand the underlying principles, techniques and approaches which constitute a coherent body of knowledge in operating systems.
3. To make students understand how operating system is used as a resource manager.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT I

Introduction to Operating System:- OS, History & Types of OS, Functions/Operations of OS, Users services/jobs, Segmentation, Virtual memory and Page Replacement algorithms, Scheduling:-Process states, virtual processors, interrupt mechanism, scheduling algorithms- Pre-emptive and Non pre-emptive scheduling; Scheduling Algorithms: FCFS, SJFS, Priority scheduling, Multilevel queue scheduling, Multilevel feedback queue scheduling.

UNIT II

System Deadlock:-System Model, Deadlock Characterization: Necessary conditions, Resource

Allocation graph, Method for handling deadlock, Deadlock prevention: Mutual Exclusion, Hold and wait, No Pre-emption, Circular wait, Deadlock Avoidance: Safe state, Resource Allocation graph Algorithm, Banker's Algorithm; Deadlock Detection, Recovery from deadlock.

UNIT III

Memory Management: Hierarchy of memory types, Cache memory: Types: Associative memory, direct mapped, set associative.

Memory Allocation: Address binding, Address Space, Memory Protection, Contiguous and Non-Contiguous allocation, Swapping, Fragmentation; Paging: Protection, Shared pages, Techniques for structuring of page table.

UNIT IV

Segmentation: Segmentation with paging; Virtual Memory: Demand paging; Page replacement Algorithms: FIFO, Optimal, LRU, LFU, MFU, Working set, Thrashing;

References Resources::

1. Silberschatz and Peter B.Galvin, "Operating System Concepts" Addison Wesley Publishing Company
2. Dhamdhere, ―Systems Programming & Operating Systems" Tata McGraw Hil
3. Sharma Anshuman -Fundamentals of Operating System, Lakhanpal Publisher
4. Operating System by Madnick Donovan.

B.Voc. (Software & Development)
Semester : IV

Paper Title: Web Programming
Paper Code: SD 209 **Credits: 06**

Job Roles: *Information and system operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer.*

Objectives:

1. To introduce the whole range of web technologies starting from HTML, DHTML, JAVA SCRIPT.
2. To focus on practical aspects of the web technologies.
3. To make the students understand the various steps in designing a creative and dynamic website.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

SECTION – A

Basic terminology: About Web Server; Web Client/Browser, Understanding how a Browser communicates with a Web Server, Website, Webpage, Static Website, Dynamic Website, Internet, Intranet, Extranet, WWW, URL

HTML: Structure of an HTML program, Paragraph Breaks, Line Breaks; Emphasizing Material in a Web Page (Heading Styles, Drawing Lines); Text Styles (Bold, Italics, Underline); Other Text Effects (Centering (Text, Images etc.)

Lists: Unordered List, Ordered Lists, Definition lists Adding Graphics to HTML Documents using the Border, Width, Height, Align, ALT Attributes

Tables: Caption Tag, Width, Border, Cell padding, Cell spacing, BGCOLOR, COLSPAN and ROWSPAN Attributes.

SECTION – B

Linking Documents: Anchor tag, External Document References Resources:, Internal Document References Resources: and Image Maps

Frames: Introduction to Frames: The <FRAMESET> tag, The <FRAME> tag, Targeting Named Frames

DHTML: Introduction to cascading style sheets (CSS), Style tag, Link tag, Types of CSS: In-Line, Internal, External

Forms: Attributes of Form element, Input element, The Text Element, Password, Button, Submit Button, Reset Button, The Checkbox, Radio, TextArea, Select and Option

SECTION – C

Java Script: Introduction and Features of JavaScript, Writing JavaScript into HTML, tokens, data types, variables, operations, control constructs, strings arrays, functions, core language objects, client side objects, event handling. Applications related to client side form validation.Other Built-In Objects in JavaScript: The String Object, The Math Object, The Date Object;

SECTION – D

Introduction to Dreamweaver: Understanding Workspace Layout, Managing Websites, Creating a Website, Using Dreamweaver Templates, Adding New WebPages, Text and Page Format, Inserting Tables, Lists, Images, Adding Links.

Web Hosting: Understanding Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free), Uploading the Website to Remote Server, Introduction to Open Source Third party FTP Tools

References Resources::

1 Wanger & Wyke	:	Java Script Unleased, Pearson Education, New Delhi.
2 Bayross, Ivan :	:	HTML, DHTML, Java Script by BPB, Latest reprint
3 Schildt , Herbert	:	The Complete Reference Java 2, TMH, Latest reprint
4 Thomas Powell	:	HTML & CSS: The Complete Reference
5 John Pollock	:	JavaScript, A Beginner's Guide
6 Janine C. Warner	:	Dreamweaver CS5 For Dummies Paperback Edition
7 Joseph Lowery	:	Adobe Dreamweaver CS5 Bible Paperback Edition
8 David Powers	:	The Essential Guide to Dreamweaver CS4

B.Voc. (Software & Development)
Semester : IV

Paper Title: Java Programming
Paper Code: SD 210 **Credits: 06**

Job Roles: *Information and system operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer.*

Objectives:

1. To write programs in Java using object-oriented paradigm.
2. To familiarize students with the fundamentals of Java programming, program design and problem-solving.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit I

Introduction to java: Definition, Comparison of java with C++, byte code, java virtual machine, constants ,variables, data types, operators, expressions, control structures, concept of class, creating objects, accessing class members, constructors, method overloading.

Unit II

Packages and interfaces: Defining a package, understanding CLASSPATH, access protection: importing packages, interfaces, defining an interface, implementing interfaces, applying interfaces, variables in interfaces. Exception handling: Definitions, types, try and catch multiple try and catch, built in exceptions.

Unit III

Multithreading: Java thread model, thread priorities, synchronizations, messaging, thread class and runnable interface, main thread: creating a thread, implementing runnable extending thread, creating multiple threads.

Unit IV

I/O applets: I/O Basics: streams, predefined streams, reading console I/P, writing console O/P, print writer class, reading and writing files, applet fundamentals, AWT controls, layout managers and menus, string handling and event handling.

References Resources::

1. Phillips LEE and Darmell Rick: Computer Graphics, Second Edition, PHI, New Delhi.
2. Daniel Dang,: An Introduction to Java Programming, PHI, New Delhi.
3. Anshuman Sharma:Learn Programming in JAVA, Lakhanpal Publisher
4. Balaguruswamy, E.: Programming with Java, A Primer, TMH, New Delhi Wanger & Wyke,: Java Script Unleased, Techmedia, New Delhi.

B.Voc. (Software & Development)
Semester : IV
Paper Title: COMPUTER BASED ACCOUNTING
Paper Code: SD 211 **Credits: 06**

Job Roles: *Information and system operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer.*

Objective:

1. To equip the students with the basic knowledge of accounting and implement it by using software package TALLY.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT I

Accounting: concepts and conventions, double entry system of accounting, introduction of basic books of accounts of sole proprietary concern, control accounts for debtors and creditors, closing of books of accounts and preparation of trial balance, Final Accounts: Trading, profit and loss accounts and balance sheet of sole proprietary concern with normal closing entries, Introduction to manufacturing account, final accounts of partnership firms, limited company.

UNIT II

Introduction to computerized financial accounting: coding logic and codes required, master files, Transaction files, Introduction to documents used for data collection, processing of different files, outputs obtained,

UNIT III

Introduction to computerised Inventory control, types of inventory and associated documents, Inventory reports-nature and types, Inventory Control : ABC and Ageing analysis, Methods of Stock validation : LIFO, FIFO, actual bases, Interfacing Inventory with Financial Accounting, Purchasing Sub-Systems, Sales Order processing. Introduction to Computerised Payroll & Invoicing Applications, Exposure to: Structure, Processing and Reports, Interfacing these applications to financial Accounting.

UNIT IV

Use of Accounting package Tally: Introduction to Tally, Groups, Ledgers, Vouchers, Orders, Cost Centres and Categories. Stock. Reports in Tally

References Resources::

1. Kellock, J.: Elements of Accounting, Heinemann 1st ed., London.

2. Rockley, L.E.,: Finance for the Non-Accountant 2nd. Edition, London: Business Book.
3. Levy and Sarnat,: Principle of Financial Management, Prentice Hall International, PHI.
4. Arnold,: Financial Accounting, Prentice-Hall International (Paperback Edition).
5. Horngren and Sundem: Introduction to Financial Accounting, Prentice-Hall International (Paperback Ediion) N.D: PHI.
6. Murthy, U.S: Management Finance, 2nd. Edition, Vakils Fefers & Simons Ltd.
7. Van Home, James, C.: Financial Management & Policy, Prentice Inc.
8. Pandey, I.M.: Financial Management, Vikas Publication, 6th Rev. ed., N. Delhi.

B.Voc. (Software & Development)
Semester : IV

Paper Title: Summer Industrial Training
Paper Code: SIT-401 **Credits: 06**

Job Roles: *Information and system operation manager, Software Programmer, System Analyst, I.T. Officers, Computer Assistants for the General Office & Accounts Management, Database Administrator, Network Administrator, Website Development Programmer.*

At the end of the semester, students should compulsorily undergo two week industrial training and the relevant certificate and project report has to be submitted.

The report should consist of the following:

1. Cover page including project title, name of the student, name of department and project guide.
2. Acknowledgements
3. Contents with page number
4. Introduction and background of the application
5. Objectives
6. System analysis
7. System feasibility study
8. Further scope of the project
9. Bibliography
10. Appendices

B.Voc. (Software & Development)
Semester : V

Paper Title: Software Engineering and Quality Assurance
Paper Code: SD 302 **Credits: 06**

Job Roles: *Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer.*

Objectives:

1. To make students familiar with all the software development principles, models and designing tools required to develop the software.
2. To make students understand theories, methods, and technologies applied for professional software development.
3. To discuss the concepts of software products and software processes.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit I

Introduction: Characteristics, Software Engineering goals, Software Process Models: Waterfall, Spiral, Prototyping, Fourth Generation Techniques and Software Development Life Cycle.

Software Project Management: Software project management, Project planning and control, cost estimation, project scheduling using PERT and GANTT charts.

Unit II

Software Design: Basic issues in software design, modularity, cohesion, coupling and layering, function-oriented software design: DFD and Structure chart, Object-oriented software development, user interface design.

Unit III

Software Testing: Fundamentals of testing, White-box and black-box testing, Test coverage analysis and test case design techniques, Mutation testing, Static and dynamic analysis, Software Metrics, Types of Software Metrics.

Unit IV

Software Quality Assurance Concepts and Standards: Quality Concepts, Quality Control, Quality Assurance, SQA Activities, Software Reviews, Formal Technical Reviews, Review Guidelines, Software Reliability, Software Safety, Quality Assurance Standards, ISO 9000, ISO 9001:2000, Quality Factors, CMM, TQM, Six Sigma, SPICE, Software Quality Assurance Metrics.

References Resources::

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach ", Sixth Edition, McGraw Hill
2. R.E. Fairley, "Software Engineering Concepts", Paperback Edition, McGraw Hill.
3. Jalota, "An Integrated Approach to Software Engineering", Third Edition, Narosa Publishing House
4. Rajib Mall," Fundamentals Of Software Engineering", PHI Learning Pvt. Ltd.

B.Voc. (Software & Development)
Semester : V
Paper Title: Computer Graphics and Multimedia Applications
Paper Code: SD 303 **Credits: 06**

Job Roles: *Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer.*

Objectives:

1. To study the graphic techniques and algorithms and enable the students develop their creativity.
2. To write programs that demonstrates image processing techniques.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit I

Introduction to Computer Graphics: Overview of Graphics Systems, Display Devices, Hardcopy Devices, Interactive Input Devices- Pointing and positioning devices (cursor, light pen, digitizing tablet, the mouse, track balls).

Unit II

Graphics Packages: Studying the Features and Developing Computer Graphics Using Standard Graphics packages like Auto CAD and Paint Brush.

Unit III

Applications of Multimedia and software packages: Multimedia in the Real World, Training and Education, Image Processing. Studying features and use of Multimedia Image Processing authoring tools like Photoshop and Macromedia Director.

Unit IV

Multimedia Technology: Multimedia in use: Introducing multimedia, uses of multimedia, Technology System Components, Multimedia Platforms, Development Tools, Image, Audio, Video, Storage for multimedia and Communications.

References Resources: :

1. Hearn and Backes, 1997 : Computer Graphics, Second Edition, PHI, New Delhi.
2. Kanetkar Yashwant, 2003 : Graphics Under 'C', BPB Publications.
3. Judith Jeffcoate, 2007: Multimedia in Practice, Technology and Applications, PHI.
4. Foley, Vandom, Fenier, :Computer Graphics, Principles and Practice, IV
5. Hughes, 1 9 9 6Edition in 'C'; Addison Wesley Publishers.
6. Ian R. Sinclair, 1994: Multimedia on the PC (with CDROM), BPB Publications.
7. Hillman, David, 1998:Multimedia Technology and Applications, ITP.
8. Vaughan, Tay, 2008:Multimedia Making it Work, Osborne Publishers.
9. Kelly & Bootle, 1989: Turbo 'C', BPB Publications.

B.Voc. (Software & Development)
Semester : V

Paper Title: ASP.Net using C#
Paper Code: SD 304 **Credits: 06**

Job Roles: *Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer.*

Objectives:

1. To make students familiar with development of console, windows and web applications using C# on .NET platform.
2. To improve object-oriented programming skills through practice and insights gained by studying a new programming language.
3. To gain a working knowledge of the C Sharp programming language and build object-oriented applications using C Sharp.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT I

Introduction to ASP.NET: .NET Architecture, ASP.NET Fundamentals Compilation Modes of .Net Architecture, Understanding Client Server Architecture, Introduction To Web Technologies.

UNIT II

Standard Rich Controls: Templates in ASP. NET, Composite Data Bound Controls, Designing Website With Master Pages, Maintaining Application State, Microsoft Application Block, OOPS/COM/DLL/Assembly.

UNIT III

Globalization And Localization: Custom Controls, Web User Controls , Caching Application Pages and Data , Security, Java Scripts, JQUERY, AJAX .NET .

UNIT IV

Windows Mobile Application Development: Application Development mobile Browsers, Android Applications, LINQ, XML, XSLT, Web Services, WPF (SILVERLIGHT), WCF, Deployment.

Suggested Resources for Readings:

1. Jones, Bradley L.: Sams Teach Yourself C# in 21 Days.
2. Balagurusamy, E.: Programming in C#, Tata McGraw-Hill.
3. Liberty, J.: Programming C#, O'Reilly.
4. Schildt, Herbert: The Complete Reference: C#, Tata McGraw-Hill.
5. Robinson: Professional C#, Wrox Press.
6. Jason Beres: SAMS Teach Yourself Visual Studio.Net in 21 days.

B.Voc. (Software & Development)
Semester : V

Paper Title: Linux operating System
Paper Code: SD 305 **Credits: 06**

Job Roles: *Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer.*

Objectives:

1. To get familiar with Linux system, its commands, files & directories, system, shell programming,
2. To introduce the student with Unix/Linux kernel programming techniques.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT I

Introduction to Linux : What is Linux, Linux's History, Minimum System Requirements; Installing Linux : Working with Linux, Floppy-less Installation, Boot and Root Disks, Choosing Text or Graphics Installation, Setting up your Hard Drive, Formatting the Partitions, Setting up the Ethernet, Configuration X, Selecting packages to Install, Using LILO; Partitioning the Hard Disk : Linux Swap Space Partitions, Linux's fdisk, Enabling the Swap Space for Installation, Creating the Linux File-system partition, Using LILO .

UNIT II

Using Linux : Starting and Stopping your Linux System, Linux Shutdown Commands, Login, Passwords, Creating a New Login, Logging Out; Trying out your new Login : Linux Error Messages, Search Paths; The who Command, Commands and Programs, Basic Linux Commands : How Linux Commands Work, Command Options, Other Parameters, Input and Output Redirection, National conventions used to Describe Linux commands, Online help available in Linux, The Linux Man pages, Finding keywords in Man pages, The bash shell help facility; Wildcards : * and ?, Environment Variables, Process and How to Terminate them, The process status Commands : ps, The process termination command : kill, the su command, the grep command.

UNIT III

Using the File System: Files Overview, Common types of files, filenames, Directories an Overview, Parent directories and sub-directories, The root directory, How directories are named, The home directory; File and Directory Permissions : File and Directory

ownership, User and ownership, Groups, Changing group ownership, File Permissions, UMASK Setting, Changing File Permission, Changing directory permissions. Bash: What is Shell? How the Shell gets Started, The most common Shells; The Bourne Shell: Command-line Completion, Wildcards, Command History, Aliases, Input Redirection, Output Redirection, Pipelines Shell, Prompts, Job control, Customizing bash, bash commands, bash variables, tcsh : An Introduction to tcsh, Command completion, Wildcards, Command History, Aliases, Input and Output Redirection, Pipelines, Prompts, Job Control; Key Bindings, Correcting Spelling Errors, Pre-commands, Change directory Commands, Monitoring Logins and Logouts, Customizing tcsh, tcsh Command Summary, tcsh variables.

UNIT IV

Shell Programming: Creating and Running Shell Programs, Using variables: Assigning a value to a variable, Accessing the value of a variable, Positional Parameters and other Built-In Shell Variables; The Importance of Quotation Marks : The test Command, The tcsh Equivalent of the test command, Conditional Statements : if Statement , case Statement; Iteration Statements : for Statement, while Statement, until Statement, shift Command, select Statement, repeat Statement, Functions.

Editing and Typesetting : Text Editors vi, The vi Editor, Starting vi, vi modes, Inserting

Text, Quitting vi, Moving the Cursor, Deleting Text, Copying and Moving Text, Searching and

Replacing Text, Setting PReferences Resources:.

Suggested Resources for Readings:

1. Tim Parker: Linux Unleashed, Techmedia Publishing House.
2. Norton, P.: Complete guide to LINUX, Techmedia.
3. Komarinski, M.: LINUX System Administration Handbook, AW.
4. John Goerzen: Linux Programming Bible, IDG Books, New Delhi.
5. Venkateshmurthy, M.G.: Introduction to Unix & Shell Programming, Pearson Education.

B.Voc. (Software & Development)
Semester : VI

Paper Title: E-Commerce
Paper Code: SD 308 **Credits: 06**

Job Roles: *Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer*

Objectives:

1. To integrate the knowledge of foundational functional areas of commerce in order to develop a holistic perspective on the role of IT in organizations.
2. To discuss emerging e-commerce topics.
3. To apply the concepts of Internet security and multimedia in e-business applications.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit-I

Introduction - E-commerce. Advantages, Types and Classification of e-commerce, Building the Web site, Internet, Online transaction, Shopping Card, Software, Risk of e-commerce, email Ids.

Digital Signature: Digital Signature and its Application in E-Commerce, E-Commerce Privacy and Trust.

Unit-II

Enterprise Resource Planning: The Emergence of ERP Systems, Business benefits of ERP,ERP Modules and design alternatives, challenges of ERP implementation, Business Processed engineering, ERP system development process.

Unit-III

Mechanism of making payment through internet: Online payment mechanism; Electronic Payment systems, payment Gateways, Visitors to website, tools for promoting websites; Plastic Money: Debit Card, Credit Card.

Unit-IV

Growth of E-Commerce - Present and potential Data and Measurement issue for E-Commerce. The infrastructure for E-Commerce, Recent and Near terms, Video Conferencing and Internet. Entertainment Education Health Services, Professional Services, Publishing, Financial Services, Web Site Evaluation.

Suggested Resources for Readings:

1. KalaKota, Ravi & Whinston, Andrew B.: Frontiers of Electronic Commerce; Addison Wesley.
2. Mary Sumner: Enterprise Resource Planning, Pearson Education.
3. Bajaj, Kamlesh & Nag, Debjani: E-Commerce-The Cutting Edge of Business; TataMcGraw-Hill.
4. Rajesh Ray: Enterprise Resource Planning – Text and cases, TMH.
5. Minoli, Daniel & Minoli, Emma: Web Commerce Technology Handbook; Tata McGraw Hill.

B.Voc. (Software & Development)
Semester: VI

Paper Title: Emerging Technologies in Computing
Paper Code: SD 309 **Credits: 06**

Job Roles: *Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer*

Objectives:

1. This course enables students to be familiar with Emerging Technologies such as Parallel Computing, Cloud Computing, Green Computing and Data Mining & data warehousing.

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit-I

Parallel Computing: Concept of Parallel Computing, Flynn's Classical Taxonomy: SISD, SIMD, MISD, MIMD; Parallel Computer Memory Architectures: Shared Memory, Distributed Memory, Hybrid Distributed-Shared Memory; TDB and BNP Class of Scheduling Algorithms.

Unit-II

Cloud Computing: Introduction and use, Architecture, Service Models: infrastructure as a service, platform as a service, and software as a service.

Unit-III

Green Computing IT Fundamentals: Business, IT, and the Environment. Green Assets:

Buildings, Data Centers, Networks, and Devices

Unit-IV

Data mining & Warehouse: KDD versus data mining, Stages of the Data Mining Process-task primitives, Data Mining Techniques -Data mining knowledge representation – Data mining query languages, Integration of a Data Mining System with a Data Warehouse

Suggested Resources for Readings:

1. 1.Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, Morgan
2. Kaufmann Publishers, ISBN: 1558604898
3. Alex Berson and Stephen J. Smith, " Data Warehousing, Data Mining & OLAP", TataMc
4. Graw Hill.
5. G. K. Gupta, "Introduction to Data Min Data Mining with Case Studies", Easter Economy
6. Edition, Prentice Hall of India,
7. Joshy Joseph, Craig Fellenstein : Grid Computing, Pearson Education.
8. M. Sasikumar, Dinesh Shikhare, P. Ravi Prakash: Introduction to Parallel Processing,PHI.
9. John Lamb, "The Greening of IT", Pearson Education.
10. Jason Harris, "Green Computing and Green IT- Best Practices on regulations & industry", Lulu.com.

B.Voc. (Software & Development)
Semester: VI

Paper Title: Network Management

Paper Code: SD 310 **Credits: 06**

Job Roles: *Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer.*

Objectives:-

1. This course will enable the students to manage the network devices and configuring servers

Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

Unit-I

Management of Network Devices:- Managing network devices :- Routers, Switches, hubs Startup and Configuration

Unit-II

Configuring and installing Window based servers:- Configuring IP addresses , Installing and Configuring Windows Server - Preparing for Installation, Creating windows server boot disk, Installing windows server, Configuring server/ client

Unit- III

Configuring & installing Linux based Servers:- Configuring IP addresses , steps for installing linux based server, installation of drivers , Configuring server on the network

Unit-IV

Windows Networking: Sharing files and resources:- User Accounts, Groups, Permissions & Their Role in Sharing, The Basic Concepts in Network Sharing, Customizing Your Network Sharing Settings, How to Share Devices With Others On the Network.

References Resources::-

1. **Network Management:** Concepts and Tools:- Edited by ARPEGE Group: CHAPMAN & HALL
2. **Installing & Configuring Windows Server 2012 R2:-**Craig Zacker
3. **Complete Linux Servers:-Installation & Configuration:-** Chetan Soni

B.Voc. (Software & Development)
Semester : VI

Paper Title: PHP Programming
Paper Code: SD 311 **Credits: 06**

Job Roles: *Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer.*

Objectives*:-This course will enable the students to learn the PHP language for website development*

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Instructions:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of **NINE** questions comprising Two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT – I

Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

UNIT – II

Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

UNIT – III

Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times.

UNIT – IV

Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files-Writing Files-Processing Directories. Working with Database and SQL : Introducing Database and SQL- Using MySQL-Adding and modifying Data-Handling Errors – Using SQLite Extension and PDO Extension. Introduction XML—Simple XML and DOM Extension.

Suggested Resources for Readings:

1. Christopher J.Goddard, Mark White, —Mastering VB Script□, Galgotia publications, New Delhi. Lee Purcell, Mary Jane Mara, —The ABCs of Javascript
2. Steven Holzner, —PHP: The Complete Reference
3. Note: Latest and additional good books may be suggested and added from time to time.

B.Voc. (Software & Development)
Semester : VI
Paper Title: Summer Industrial/ In-house Training and Comprehensive Viva

Paper Code: SIT-601 **Credits: 06**

Job Roles: *Java Programmer Trainee, Linux Administrator, Web Programmer Trainee, Database administrator, Network Administrator, C#.net software developer, System Analyst, Software Quality engineer.*

The students will have to undergo 8 week training and prepare a project during internship. They shall submit the project report at the completion of the internship. The project will involve development of application/system software in industrial/ commercial/ scientific environment. The objective of this course is to translate a problem by designing software.

The report should consist of the following:

1. Cover page including project title, name of the student, name of department and project guide.
2. Acknowledgements
3. Contents with page number
4. Introduction and background of the application
5. Objectives
6. System analysis
7. System feasibility study
8. Further scope of the project
9. Bibliography
10. Appendices