PANJAB UNIVERSITY, CHANDIGARH-160014 (INDIA)

OUTLINES OF TESTS SYLLABI AND COURSES OF READING

FOR

Bachelor of Vocation (SOFTWARE DEVELOPMENT)

Session 2017-18

(1\textsuperscript{st} to 6\textsuperscript{th} Semester)
**SCHEME OF B.Voc. (SOFTWARE DEVELOPMENT)
(SEMESTER SYSTEM)**

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*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
**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 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

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<th>Title</th>
<th>Generic/ Skill Component</th>
<th>Theory/ Practical</th>
<th>Internal (Theory)</th>
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<th>Internal (Practical)</th>
<th>External (Practical)</th>
<th>Credit</th>
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<tr>
<td>*GEN - 501</td>
<td>Critical Thinking and Elementary Statistics</td>
<td>Generic</td>
<td>Theory</td>
<td>20</td>
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<tr>
<td>SD 302</td>
<td>Software engineering and quality assurance</td>
<td>Generic</td>
<td>Theory</td>
<td>20</td>
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<td>SD 303</td>
<td>Computer graphics and Multimedia Applications</td>
<td>Skill Component</td>
<td>Theory &amp; Practical</td>
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<tr>
<td>SD 304</td>
<td>ASP.NET using C#</td>
<td>Skill Component</td>
<td>Theory &amp; Practical</td>
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<tr>
<td>SD 305</td>
<td>Linux operating System</td>
<td>Skill Component</td>
<td>Theory &amp; Practical</td>
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**Note:** Winter Industrial/ In-house Training of 2-3 weeks in a relevant area after 5th Semester Examinations in winter break.

#### Semester VI

<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Title</th>
<th>Generic/ Skill Component</th>
<th>Theory/ Practical</th>
<th>Internal (Theory)</th>
<th>External (Theory)</th>
<th>Internal (Practical)</th>
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<td>*GEN 601</td>
<td>Entrepreneurship Development Programme</td>
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<tr>
<td>SD 308</td>
<td>E- Commerce</td>
<td>Generic</td>
<td>Theory</td>
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<tr>
<td>SD 309</td>
<td>Emerging Technologies in Computing</td>
<td>Skill Component</td>
<td>Theory &amp; Practical</td>
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<tr>
<td>SD 310</td>
<td>PHP Programming</td>
<td>Skill Component</td>
<td>Theory &amp; Practical</td>
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<tr>
<td>SD 311</td>
<td>Network Management</td>
<td>Skill Component</td>
<td>Theory &amp; Practical</td>
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<tr>
<td>**SIT- 601</td>
<td>Summer Industrial/ In-house Training and Comprehensive Viva</td>
<td>Skill</td>
<td>Practical</td>
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*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:  
3. Learn Programming in C, Anshuman Sharma, Lakhanpal Publisher  
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,

**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:**

4. Anshuman Sharma: Fundamentals of Information Technology, Lakhanpal Publisher
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  
4. Data Communications and Networking by Behrouz A. Forouzan
B.Voc. (Software & Development)
Semester: II
Paper Title: **Relational Database Management System**
Paper Code: SD108

**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 Database Design, Data Models and different Database 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
B.Voc. (Software & Development)

Paper Title: RDBMS using MySQL

Semester: II

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

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
4. Dr. Madhulika Jain, Vinita Pillai, Shashi Singh and Satish Jain, “Introduction to Database Management”, BPB.
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.
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:
3. Learn Programming in C, Anshuman Sharma, Lakhanpal Publisher
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


Unit-II


Unit-III

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


References Resources:
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


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:
B.Voc. (Software & Development)
Semester : III
Paper Title: Object oriented programming using C++
Paper Code: SD203         Credits: 06


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

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.

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.
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


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

Paper Title: **Data Communications and Networks**
Paper Code: SD 205

**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**
**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**

**Unit-IV**

**References Resources::**
1. Computer Networks, Pearson Education by Andrew S. Tanenbaum
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


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

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::
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 Java Script, Writing Java Script 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 Java Script: 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 Web Pages, 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::**

2. Bayross, Ivan : HTML, DHTML, Java Script by BPB, Latest reprint
4. Thomas Powell : HTML & CSS: The Complete Reference
6. Janine C. Warner : Dreamweaver CS5 For Dummies Paperback
7. Joseph Lowery : Adobe Dreamweaver CS5 Bible Paperback
8. David Powers : The Essential Guide to Dreamweaver CS4
Paper Title: Java Programming
Paper Code: SD 210
Credts: 06


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:
2. Daniel Dang,: An Introduction to Java Programming, PHI, New Delhi.
3. Anshuman Sharma:Learn Programming in JAVA, Lakhanpal Publisher
B.Voc. (Software & Development)

Semester : IV

Paper Title: COMPUTER BASED ACCOUNTING

Paper Code: SD 211        Credits: 06


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

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


At the end of the semester, students should compulsorily undergo two week industrial training (SD 212) 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

**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**


**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**


**References Resources:**
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:**

**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**


**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:**

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

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


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

UNIT IV


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:
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
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

Suggested Resources for Readings:
4. Rajesh Ray: Enterprise Resource Planning – Text and cases, TMH.
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

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. Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, Morgan Kaufmann Publishers, ISBN: 1558604898
5. M. Sasikumar, Dinesh Shikhare, P. Ravi Prakash: Introduction to Parallel Processing, PHI.
B.Voc. (Software & Development)
Semester : VI

Paper Title: PHP Programming
Paper Code: SD 310
Credits: 06


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

UNIT – II

UNIT – III

UNIT – IV

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: **Network Management**  
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:**
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**


**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: **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