

SRI DHARMASTHALA MANJUNATHESHWARA COLLEGE (AUTONOMOUS)



UJIRE - 574 240

DAKSHINA KANNADA, KARNATAKA STATE

(Re-Accredited by NAAC at 'A' Grade with CGPA 3.61 out of 4)

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DEPARTMENT OF B.SC. COMPUTER APPLICATION

Syllabus of
Bachelor's Degree in Science
(Basic and Honours Programmes)

with

Computer Science as Major Course
Syllabus for I and II Semesters

And Open Elective Courses in Computer Science

CHOICE BASED CREDIT SYSTEM
SEMESTER SCHEME
UNDER NEW EDUCATION POLICY 2020
2021-22 ONWARDS

Approved by the BOS meeting held on 23rd November 2021
Approved by the Academic Council meeting, held on 10-12-2021



Model Programme Structure (B2) for Bachelor of Science (Basic/Honours) Programme (Subjects with Practical)

***In lieu of the research Project, two additional elective papers/Internship may be offered.**

Sem.	Discipline Core (DSC) (Credits)	Discipline Elective (DSE) /Open Elective (OE) (Credits)	Ability Enhancement Compulsory Courses (AECC), Languages (Credits) (L+T+P)		Skill Enhancement Courses (SEC)			Total Credits
					Skill based (Credits) (L+T+P)	Value based (Credits) (L+T+P)		
I	DSC A1(4+2) DSC B1(4+2)	OE-1 (3)	L1-1(3), L2-1(3) (4 hrs. each)		SEC-1: (2) (1+0+2)	Yoga (1)(0+0+2)	Health & Wellness (1) (0+0+2)	25
II	DSC A2(4+2) DSC B2(4+2)	OE-2 (3)	L1-2(3), L2-2(3) (4 hrs. each)	Environmental Studies (2)		Sports (1) (0+0+2)	NCC/NSS/R&R(S&G)/Cultural (1)(0+0+2)	25
Exit option with Certificate (48 credits)								
III	DSC A3(4+2) DSC B3(4+2)	OE-3 (3)	L1-3(3), L2-3(3) (4 hrs. each)		SEC-2: (2)(1+0+2)	Sports (1) (0+0+2)	NCC/NSS/R&R(S&G)/Cultural (1) (0+0+2)	25
IV	DSC A4(4+2) DSC B4(4+2)	OE-4 (3)	L1-4(3), L2-4(3) (4 hrs. each)	Constitution of India (2)		Sports (1) (0+0+2)	NCC/NSS/R&R(S&G)/Cultural (1) (0+0+2)	25
Exit option with Diploma in a particular Discipline (96 credits)								
V	DSC A5(3+2) DSC A6(3+2) DSC B5(3+2) DSC B6(3+2)				SEC-3: SEC (2) (1+0+2)	Sports (1) (0+0+2)	NCC/NSS/R&R(S&G)/Cultural (1) (0+0+2)	24
VI	DSC A7(3+2) DSC A8(3+2) DSC B7(3+2) DSC B8(3+2)				SEC-4: Professional Communication (2)	Sports (1) (0+0+2)	NCC/NSS/R&R(S&G)/Cultural (1) (0+0+2)	24
Exit with Bachelor of Degree in a particular Discipline (140 credits)								



Curriculum Structure

Program: B.Sc. (Basic and Honors)

Subject: Computer Science

Sem	Discipline Specific Core Courses(DSC)	Hours/Week		Discipline Specific Elective Courses (DSE)/ Vocational Courses (VC)	Hours/Week
		Theor y	La b		
1	DSC-1: Computer Fundamentals and Programming in C DSC-1Lab: C Programming Lab	4	4		
2	DSC-2: Data Structures using C DSC-2Lab: Data structures Lab	4	4		
3	DSC-3: Object Oriented Programming Concepts and Programming in JAVA DSC-3Lab: JAVA Lab	4	4		
4	DSC-4: Database Management Systems DSC-4Lab: DBMS Lab	4	4		
5	DSC-5: Programming in PYTHON DSC-6: Operating System Concepts DSC-5Lab: PYTHON Programming lab DSC-6Lab: Operating System lab	3 3	4 4	VC-1: Any one from Vocational Courses, Group – 1*	3
6	DSC-7: Internet Technologies DSC-8: Computer Networks DSC-7Lab: JAVA Script, HTML, CSS Lab DSC-8Lab: Research Project	3 3	4 4	VC-2: Any one from Vocational Courses, Group – 2* Research Project:	3 2



*** Vocational Courses****Group-1**

- DTP, CAD and Multimedia
- Hardware and Server Maintenance
- Web Content Management Systems
- E-Commerce
- Web Designing

Group-2

- Health Care Technologies
- Digital Marketing
- Office Automation
- Multimedia Processing
- Accounting Package

**** Discipline Specific Elective Courses****Group-1**

- IoT
- Cyber Law and Cyber Security
- Web Programming - PHP and MySQL
- Clouds, Grids, and Clusters
- Software Testing

Group-2

- Information and Network Security
- Data Compression
- Discrete Structures
- Open source Programming
- Multimedia Computing
- Big Data

Group-3

- Data Analytics
- Storage Area Networks
- Pattern Recognition
- Digital Image Processing
- Parallel Programming
- Digital Signal Processing



First Semester

Course Code: DSC-1	Course Title: Computer Fundamentals and Programming in C
Course Credits: 4	Hours of Teaching/Week: 4
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 3 Hours

Course Outcomes (COs)

After completing this course satisfactorily, a student will be able to:

- Operate desktop computers to carry out computational tasks
- Understand working of hardware and software and the importance of operating systems
- Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts
- Read, understand and trace the execution of programs written in C language
- Write the C code for a given problem
- Perform input and output operations using programs in C
- Write programs that perform operations on arrays

Course Content

Content	Hours
Unit - 1	
<p>Fundamentals of Computers: Introduction to Computers –Definition of a computer, Characteristics of computers, Evolution of computers, Generations of computers, Classification of computers. Computer system, applications of computers.</p> <p>Number Systems – different types, conversion from one number system to another; Coding schemes –ASCII and Unicode.</p>	13



<p>Computer Software – Categories of software.</p> <p>Computer Programming and Languages–Machine Level, Assembly level and Highlevel languages; Translator Programs – Assembler, Interpreter and Compiler. Developing a computer program, Program Development Cycle - Algorithm, Flowchart and Pseudocode with examples.</p> <p>Introduction to C Programming: Overview of C; History and Importance of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C.</p>	
Unit - 2	
<p>C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration and initialization of variables; Symbolic constants.</p> <p>C Operators and Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity. Evaluation of arithmetic expressions; Type conversion.</p> <p>Input and output with C: Formatted I/O functions - <i>printf</i> and <i>scanf</i>, control stings and escape sequences, output specifications with <i>printf</i> functions; Unformatted I/O functions to read and display single character and a string - <i>getchar</i>, <i>putchar</i>, <i>gets</i> and <i>puts</i> functions.</p>	13



Unit - 3	
<p>Control Structures: Branching: if, if-else, nested if, else-if ladder, switch. Looping: while, do-while and for loop, nested loops, exit, break, jumps in loops.</p> <p>Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.</p> <p>Strings: Declaring and Initializing string variables; String handling functions - <i>strlen, strcmp, strcpy and strcat</i>; Character handling functions - <i>tolower, toupper, tolower, isalpha, isnumeric</i> etc.</p>	13
Unit - 4	
<p>Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers.</p> <p>User-Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.</p> <p>User-Defined Data Types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.</p>	13



Text Books:

1. Pradeep K. Sinha and Priti Sinha: **Computer Fundamentals** (Sixth Edition), BPB Publication.
2. ITL Education Solution Limited, **Introduction to Information Technology**, Second Edition 2018, Pearson Education.
3. E. Balagurusamy: **Programming in ANSI C** (TMH), 7th Edition.

Reference Books :

1. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI – EEE)
3. S. Byron Gottfried: Programming with C (TMH)
4. Kernighan & Ritchie: The C Programming Language (PHI)
5. Yashwant Kanitkar: Let us C
6. P.B. Kottur: Programming in C (Sapna Book House)



Course Code: DSC-1 Lab	Course Title: C Programming Lab
Course Credits: 2	Hours of Teaching/Week: 4
Total Contact Hours: 52	Formative Assessment Marks: 20
Exam Marks: 30	Exam Duration: 3 Hours

Practice Lab

The following activities be carried out in the lab during the initial period of the semester.

1. Basic Computer Proficiency
 - a) Familiarization of Computer Hardware.
 - b) Basic Computer Operations and Maintenance.
 - c) Do's and Don'ts, Safety Guidelines in Computer Lab.
2. Familiarization of Basic Software – Operating System, Word Processors, Internet Browsers, Integrated Development Environment (IDE) with Examples.
3. Type Program Code, Debug and Compile basic programs covering C Programming fundamentals discussed during theory classes.

Programming Lab

Part A

1. Program to read three numbers and find the biggest of three.
2. Program to find the area of a triangle using three sides of triangle.
3. Program to check for prime number.
4. Program to generate n Fibonacci numbers.
5. Program to read a multi - digit number find the sum of the digits, reverse the number and check it for palindrome.
6. Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers.
7. Program to accept student name and marks in three subjects. Find the total marks, average and grade (depending on the average marks).
8. Program to find the roots of quadratic equation (Demonstration of switch Statement).



9. Program to find largest and smallest element in a list of 'n' elements
(Demonstration of one-dimensional array).
10. Program to multiply two matrices.

Part B

1. Program to accept 'n' and find the sum of the series $1! + 3! + 5! + \dots + n!$
2. Write user-defined functions to (a) find the length of a string (b) concatenate two strings. Call these functions in the main program.
3. Program to find whether a given string is palindrome or not (Use a function to reverse a string using pointers).
4. Program to transpose a matrix of order $N \times M$ and check whether it is symmetric or not.
5. Program to add two matrices using pointers.
6. Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
7. Program to display the first 'n' Fibonacci numbers using a function to generate the n^{th} Fibonacci number.
8. Program to find the GCD of 'n' integers using a function to compute the GCD of two integers.
9. Program to enter the information of n students (name, register number, marks in three subjects) into an array of structures. Compute and print the result of all students. For passing, student should get at least 35 in each subject, otherwise result is "FAIL".
If the student passes and if percentage ≥ 70 , result is DISTINCTION; If percentage is < 70 and ≥ 60 , result is FIRST CLASS; if percentage is < 60 and ≥ 50 , result is SECOND CLASS; otherwise result is PASS CLASS. Get the output of all students in a tabular form with proper column headings.
10. Program to prepare the pay slip of 'n' employees using an array of structures. Input the employee name, employee number and basic pay. Calculate the DA, HRA, PF, PT, Gross Pay and Net Pay as follows:
If Basic < 40000 , DA = 50% of Basic, HRA = 12% of Basic, PF = 12% of Gross Pay, PT = 250. Otherwise DA = 40% of Basic, HRA = 10% of Basic, PF = 13% of Gross, PT = 300. Gross Pay = Basic + DA + HRA and Net Pay = Gross Pay - PF - PT.



Evaluation Scheme for Practical Examination

Assessment Criteria		Mark s
Program-1 from Part A	Writing the Program	5
	Execution and Formatting	5
Program-2 from Part B	Writing the Program	7
	Execution and Formatting	8
Practical Records		5
Total		30



Course Code: CSOE1/CAOE1	Course Title: Office Automation
Course Credits: 3	Hours of Teaching/Week: 3
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 3 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Compare and contrast various types of operating systems
- Explain the purpose of office automation
- Describe how information is stored and retrieved in/from computer memory
- Know about various types of office automation software and their applications
- Create document using word processing software
- Design presentation using presentation software
- Create worksheets using spreadsheet software
- Store and retrieve data in/from database management application

Course Content

Content	Hours
Unit - 1	
<p>Computer software: Introduction, Software definition, Software categories, Installing and uninstalling software, Software piracy, Software terminologies</p> <p>Introduction to windows Operating System, operating with windows, GUI, use of help features, starting an application, essential accessories, creating shortcuts, windows explorer, control panel, finding folders and files, System utilities.</p> <p>MS-Office: Introduction, Office user interface, Microsoft office Components.</p> <p>MS-Word: Introduction, Starting MS-Word, Microsoft word Environment working with word documents, working with text, working with tables checking spelling and grammar, adding graphs to the</p>	12



document, mail merge, header and footers, page numbers, protect the document, working with formatting tools.	
Unit - 2	
MS-Excel: Introduction, starting MS Excel, Microsoft Excel environment, Working with Excel workbook, Working with worksheet – Entering data, Excel formatting tips and Techniques, Generating graphs, Formulas and Functions, Inserting charts, Sorting, Pivot Tables, data extraction, adding clip art, add an image from a file, Printing in Excel.	10
Unit - 3	
MS-PowerPoint: Starting MS PowerPoint, Working with PowerPoint, Creating, Saving and Printing a presentation, Working with Animation, Adding a slide to presentation, Navigating through a presentation, Slide-sorter, Slide-show, Editing slides, Working with Graphics and Multimedia in PowerPoint (Inserting Photo, Video, and Audio). The Internet: Basic internet terms, Internet applications, Internet tools, Web browser, Web browser features, Internet Explorer environment, Electronic mail, Email address structure, Advantages and disadvantages of email.	10
Unit - 4	
Database Fundamentals - Basic database terms, Database Management System. MS-Access: Introduction to Access, Creating Tables and Database, Data Type and Properties, Adding & Deleting Field in Table, Primary Key Fields, Queries, Forms: The Forms wizard saving forms, Modifying forms, Pages, Macro, Module, Reports, Printing Report, Forms.	10



Text Book :

1. ITL Education Solution Limited, Introduction to Information Technology, Second Edition., Pearson

Reference Books:

1. Peter Norton, Introduction to Computers, 7th edition, Tata McGraw Hill Publication, 2011)
2. Anita Goel, Computer Fundamentals, Pearson Education, 2011.
3. Linda Foulkes, Learn Microsoft Office 2019: A comprehensive guide to getting started with Word, PowerPoint, Excel, Access, and Outlook, Packet Publishing Limited, 2020.
4. Bittu Kumar, Mastering MS Office: Concise Handbook with Screenshots, V&S Publishers, 2017.



II Semester

Course Code: DSC-2	Course Title: Data Structures using C
Course Credits: 4	Hours of Teaching/Week: 4
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 3 Hours

Course Outcomes (COs)

After completing this course satisfactorily, a student will be able to:

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
- Demonstrate different methods for traversing trees
- Compare alternative implementations of data structures with respect to performance
- Describe the concept of recursion, give examples of its use
- Discuss the computational efficiency of the principal algorithms for sorting and searching

Course Content

Content	Hours
Unit - 1	
<p>Introduction to Data Structures: Definition, Need for Data Structures, Types of Data Structures. Linear Data Structures: Arrays - Definition, Declaration and storage of one- and two-dimensional arrays. Sparse matrices.</p> <p>Recursion: Definition; Types of recursion; Recursion Technique Examples - Fibonacci numbers, GCD, Binomial coefficient ${}^n C_r$, Comparison between iterative and recursive functions.</p> <p>Sorting: Sorting – Selection sort, Bubble sort, Quick sort, Insertion sort; Comparison of different sorting techniques.</p>	13



Unit - 2	
<p>Searching: Introduction, Linear search, Binary Search, Comparison of different searching techniques.</p> <p>Dynamic memory allocation: Static and Dynamic memory allocation; Memory allocation and deallocation functions - <i>malloc</i>, <i>calloc</i>, <i>realloc</i> and <i>free</i>.</p> <p>Linked List: Introduction, characteristics, types of linked lists, Representation of singly linked list in memory, Singly linked list – Operations, algorithms, Representation of polynomials using linked lists. Circular linked list – Operations, Doubly linked list - operations. Memory allocations.</p>	13
Unit - 3	
<p>Stacks – Array representation of stacks, Linked representation of stacks, operations, Applications of stacks Recursion, Implementation of recursive procedure by stack (factorial function and Fibonacci sequence).</p> <p>Arithmetic Expressions: Prefix, infix and postfix notation, infix to postfix conversion, evaluation of postfix expression.</p> <p>Queues: Array representation of queue, Linked representation of queue, Types of queues- Simple queue, circular queue, double-ended queue, priority queue, operations on queues.</p>	13
Unit - 4	
<p>Trees: Definition; Tree terminologies – node, root node, parent node, ancestors of a node, siblings, terminal and non-terminal nodes, degree of a node, level, edge, path, depth;</p> <p>Binary tree: Types of binary trees - strict binary tree, complete binary tree, binary search tree. Array representation of binary tree. Traversal of binary tree; <i>preorder</i>, <i>inorder</i> and <i>postorder</i> traversal; Construction of a binary tree when inorder and pre/postorder traversals are given.</p> <p>Graphs: Terminologies, Matrix representation of graphs, Traversals: Breadth First Search and Depth first search.</p>	13



Text Books

1. Sartaj Sahni: Fundamentals of Data Structures.
2. YedidyahLang sam, Moshe J. Augenstein and Aaron M. Tenenbaum, **Data Structures Using C and C++**, 2nd Edition, PHI Publication
3. Seymour Lipschutz, Schaum's Outlines Series, **Data Structures with C**, Tata McGraw Hill 2011

References

1. Kamathane: Introduction to Data structures (Pearson Education)
2. Y. Kanitkar: Data Structures Using C (BPB)
3. Kottur: Data Structure Using C
4. Padma Reddy: Data Structure Using C
Sudipa Mukherjee: Data Structures using C – 1000 Problems and Solutions (McGraw Hill Education, 2007)



Course Code: DSC-2 Lab	Course Title: Data Structures Lab
Course Credits: 2	Hours of Teaching/Week: 4
Total Contact Hours: 52	Formative Assessment Marks: 20
Exam Marks: 30	Exam Duration: 3 Hours
Programming Lab	
Part A	
<ol style="list-style-type: none"> 1. Program to compute power of a number using a recursive function. 2. Program to compute the value of n^c using a recursive function to find factorial function. 3. Program to implement dynamic array, find smallest and largest element of the array. 4. Program to read the names of cities and arrange them alphabetically. 5. Program to sort the given list using selection sort technique. 6. Program to sort the given list using bubble sort technique. 7. Program to sort the given list using quick sort technique. 8. Program to sort the given list using insertion sort technique. 9. Program to search an element using linear search technique. 10. Program to search an element using recursive binary search technique. 	
Part B	
<ol style="list-style-type: none"> 1. Program to implement queue using arrays. 2. Program to implement stack using arrays. 3. Program to implement stack using linked list. 4. Write a Program for converting an Infix Expression to Postfix Expression. Program should support both parenthesized and free parenthesized expressions with the following operators: +, -, *, /, % (Remainder), ^ (Power) and alphanumeric operands. 5. Program to evaluate a postfix expression. 	



6. Program to implement all operations on a sorted singly linked list.
7. Program to implement queue using linked list.
8. Program to implement circular queue using array.
9. Write a menu driven program for the following operations on Binary Search Tree (BST) of integers:
 - (a) Create a BST of 'n' Integers
 - (b) Traverse the BST in Inorder, Preorder and Postorder
 - (c) Search the BST for a given element and report the appropriate message
10. Program for the following operations on a graph (G) of cities:
 - (a) Create a graph of N cities using Adjacency Matrix.
 - (b) Print all the nodes reachable from a given starting node in a digraph using BFS method.

Evaluation Scheme for Practical Examination :

Assessment Criteria		Marks
Program-1 from Part A	Writing the Program	5
	Execution and Formatting	5
Program-2 from Part B	Writing the Program	7
	Execution and Formatting	8
Practical Records		5
Total		30



Course Code: CSOE2/CAOE2	Course Title: Web Designing
Course Credits: 3	Hours of Teaching/Week:
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 3 Hours

Course Outcomes (COs)

After completing this course satisfactorily, a student will be able to:

- Understand various Internet related terminologies
- Explain features and evolution of Internet
- Explain the use of search engines
- Know the use of different tags available in HTML
- Design web pages using HTML5, CSS3, XML and XHTML
- Implement websites using linked web pages.

Course Content

Content	Hours
Unit - 1	
<p>The Internet: Introduction, Evolution, basic internet terms, Getting connect to internet, Internet applications, Data over the internet.</p> <p>Internet tools: Web browser, Web browser features, Internet Explorer environment, Electronic mail, Email address structure, checking email, sending email, email attachment, How email works, advantages and disadvantages of email.</p> <p>Search Engines: Searching an internet, refining the search, Instant messaging, Features of messengers.</p>	12



Unit - 2	
<p>Overview of HTML5 -Exploring new features of HTML5, Structuring an HTML Document, Creating and saving HTML document, Viewing an HTML document.</p> <p>Fundamentals of HTML-Understanding Elements, Root elements, Metadata elements, Style element, Section element, Header and Footer element, Address element, Basic HTML data types, Data types defined by RFC and IANA Documentation.</p> <p>Working with Text: Formatting Text with HTML Elements, Defining MARK element, Defining STRONG element, Defining CODE element, Defining SMALL element.</p> <p>Organizing Text in HTML: Arranging text, Displaying Lists.</p>	10
Unit - 3	
<p>Working with Links and URLs- Exploring the Hyperlinks, Exploring the URL, Exploring Link Relations.</p> <p>Creating Tables-Understanding Tables, Describing the table element.</p> <p>Working with Images, Colors and Canvas - Inserting images in a web page, Exploring Colors, Introducing Canvas</p> <p>Working with Forms: Exploring Form element, Exploring types of the INPUT element, Exploring the BUTTON element, Exploring the Multiple-Choice elements, Exploring TEXTAREA and LABEL elements.</p> <p>Working with Frames:<FRAMESET>, <FRAME> tag with attributes.</p>	10
Unit - 4	
<p>Overview of CSS3- Understanding the syntax of CSS, Exploring CSS Selectors, Inserting CSS in an HTML document.</p> <p>Background and Color Gradients in CSS: Exploring Background of a Web Page, Exploring Color Properties, Exploring Gradient Properties, Exploring Font properties.</p>	10



Working with Basics of XML -Exploring XML, Comparing XML with HTML, Describing the Structure of an XML document.	
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Text Books:

1. IITL Education Solution Limited, Introduction to Information Technology, Pearson Education, 2012
2. DT Editorial Services, HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery), Second Edition, Dreamtech Publisher, 2016

References :

1. Laura Lemay & Rafe Colburn, Mastering Html, CSS & JavaScript, Web Publishing, 2016
2. Firuza Aibara, HTML 5 for Beginners, 2012
3. Glenn Johnson, Training Guide – Programming in HTML5 with JavaScript and CSS3 (Microsoft Press Training Guide), 2013



Scheme of Assessment for Theory Examination

Question Pattern		Marks
Part – A		
1. Answer any SIX sub-questions (6×2=12)		12
Sub-question	Unit	
a, b	1	
c, d	2	
e, f	3	
g, h	4	
Part – B		
(Answer any ONE full question from each unit – 12 marks each) (Combinations of sub-questions of 3 to 6 marks)		
Unit-1		12
2.		
3.		
Unit-2		12
4.		
5.		
Unit-3		12
6.		
7.		
Unit-4		12
8.		
9.		
Total		60

