COMPUTER SCIENCE

Class : XI-XII

"... It is unworthy of excellent men to lose hours like slaves in the labour of calculation which could safely be regulated to anyone else if machines were used.." said Leibnitz in the beginning of seventeenth Century.

Farsighted vision, in-depth study accompanied by target-oriented effort of such torchbearers have ushered in an age of computers.

Be it Science or Engineering, medical world or launching Space Shuttles, Study of Universe or global communications, Research and Development of Edutainment – the core ingredient is computer.

Learning Objectives :

1. To understand the problem statement.
2. To develop logic for problem solving.
3. To understand the concept of Object Oriented Methodology.
4. To implement Object Oriented Programming using C++
5. To understand the concept of working with Relational Database.
6. To understand the basic concept of algebra of logic.
7. To understand and explore the world of communication and networks.

Competencies :

The student will be proficient in the following :

1. Identification of a Computer System.
2. Categorisation of parts of an objective system.
3. Problem Solving.
4. Designing an efficient logic using object oriented approach for solution development.
5. Database handling.
6. Logic Circuit designing.

CLASS-XI (THEORY)

Duration : 3 hours **Total Marks :** 70

Unit No.	Unit Name	Marks
1.	Computer Fundamentals	06
2.	Programming Methodology	10
3.	Introduction to Programming in C++	44
4.	Computer System Organisation	10
		70

UNIT-1 : Computer Fundamentals

- **Evolution of Computers; Basics of computer and its operation :** Functional Components and their inter-connections, concept of Booting. Use of Operating System for directory listing, hierarchial directory

structure, renaming, deleting files / folders, formatting floppy, copying files, concepts of path and pathname, switching between tasks, installation / removal of applications;

Software Concepts :-

Types of Software : System Software, Utility Software and Application Software;

System Software : Opearing System, Compilers, Interpreters and Assembler;

Operating System : Need for operating system, Functions of Operating System (Processor Management, Memory Management, File Management and Device Management), Types of operating system - Interactive (GUI based), Time Sharing, Real Time and Distributed: Commonly used operating systems - Solaris, UNIX, LINUX, Mac OS, MS Windows;

General Functionalities of an Operating System to be illustrated and implemented using any of the above operating systems.

UNIT-2 : Programming Methodology

- General Concepts; Modular approach; Clarity and Simplicity of Expressions, Use of proper Names for identifiers, Comments, Indentation; Documentation and Program Maintenance; Running and Debugging programs, Syntax Errors, Run-Time Errors, Logical Errors;

  Problem Solving Methodology and Techniques : Understanding of the problem, Identifying minimum number of inputs required for output, Step by step solution for the problem, breaking down solution into simple steps, Identification of arithmetic and logical operations required for solution, Using Control Structure : Conditional control and looping (finite and infinite);

UNIT-3 : Introduction to Programming in C++

- *"Object Oriented Technology is regarded as the ultimate paradigm for the modeling of information, be that information data or logic. The C++ has by now shown to fulfill this goal."*

  Programming by Example in C++ Language :

  C++ character set, C++ Tokens (Identifiers, Keywords, Constants, Operators), Structure of a C++ Program (include files, main function); Header files – iostream.h. iomanip.h; **cout, cin;** Use of I/O operators (<< and >>), Use of endl and setw (), Cascading of I/O operators, Error Messages; Use of editor, basic commands of editor, compilation, linking and execution; standard input / output operations from C language; gets(), puts() of stdio.h header file;

Data Types, Variables and Constants :

- Concept of Data types; Built-in Data types : **char, int, float** and **double;** Constants : Integer Constants, Character Constants (Backslash character constants – \n, \t), Floating Point Constants, String Constants; Access modifier : **const;** Variables of built-in data types, Declaration / initialisation of variables, Assignment statement : Type modifier ; signed, unsigned, long;

Operators and Experessions :

- Operators Arithmetic operators (–, +, *, /, %), Unary operator (–), Increment and Decrement Operators (–, ++), Relational operators (>, >=, <, <=, = =, !=), Logical operators (!, &&, ||), Conditional operator : <condition>?<if true>:<else>; Precedence of Operators; Expressions; Automatic type conversion in expression, Type casting; C++ shorthand's (+=, –=, *=, /=, %=);

Flow of Control :

- Conditional statements : **if-else,** Nested **if, switch..case..default,** Nested **switch..case,** break statement (to be used in switch..case only); Loops : **while, do - while, for** and Nested loops;

Structured Data Type : Array

- Declaration / initialisation of One-dimensional arry, Inputting array elements, Accessing array elements, Manipulation of Array elements (sum of elements, product of elements, average of elements, linear search, finding maximum / minimum value);

Declaration / Initialization of a String, string manipulations (counting vowels / consonants/ digits/special characters, case conversion, reversing a string, reversing each word of a string);

String Functions :

- Header File : string.h

  Function : **isalnum (), isalpha(), isdigit(), islower(), isupper(), tolower(), toupper ();**

Character Functions :

- Header File : ctype.h
- Functions : **isalnum (), isalpha(), isdigit(), islower(), isupper(), tolower(), toupper (); strepy(), streat (), strlen(), strcmp(), strempi();**

Mathematical Functions :

- Header File : math.h, stdlib.h;
- Functions : **fabs(), log(), log10(), pow(), sqrt(), sin(), cos(), abs(),**

Other Functions :

- Header File : stdlib.h;
- Functions : **randomize(), random();**

Two-dimensional Array :

- Declaration / initialisation of a two-dimensional array, inputting array elements Accessing array elements, Manipulation of Array elements (sum of row element, column elements, diagonal elements, finding maximum / minimum values);

User Defined Functions :

- Defining a function; function prototype, Invoking / calling a function, passing arguments to function specifying argument data types, default argument, constant argument, call by value, call by reference, returning values from a function, calling functions with arrays, scope rules of functions and variables: local and global variables.

Event Programming : Games as examples

- General Guidelines : Initial Requirement, developing an interface for user (it is advised to use text based interface screen), developing logic for playing the game and developing logic for scoring points.

1. **Memory Game :** A number guessing game with application of 2 dimensional arrays containing randomly generated numbers in pairs hidden inside boxes.
2. **Cross 'N Knots Game :** A regular tic-tac-toe game.
3. **Hollywood / Hangman :** A word Guessing game.
4. **Cows 'N Bulls :** A word/number Guessing game.

UNIT-4 : Computer System Organisation

- **Number system :** Binary, Octal, Decimal, Hexadecimal and conversion between two different number systems, Integer, Floating Point, 2's complement of number from base-2;
  Internal Storage encoding for Characters : ASCII, ISCII (Indian scripts Standard Code for Information Interchange), and UNICODE, Microprocessor, Basic concepts, Clock speed (MHz, GHz), 16 bit, 32 bit, 64 bit processors; Types – CISC, RISC; Concept of System Buses, Address bus, Data bus, Concepts of Accumulator, Instruction Register, and Program Counter.
  Commonly used CPUs and CPU related terminologies : Intel Pentium Series, Intel Celeron, Cyrix, AMD Series, Xeon, Intel Mobile, Mac Series; CPU Cache; Concept of Heat sink and CPU fan, Motherboard; Single, Dual and Multiple processors;
  Types of Memory : Cache (L1, L2), Buffer, RAM (DRAM, SDRAM, RDRAM, VRAM), ROM (PROM, EPROM), Hard Disk Drive, Floppy Disk Drive, CD/DVD Drive; Access Time;
  Input Output Ports / Connections : Power connector, Monitor Socket, Serial (COM) and Parallel (LPT) port, Universal Serial Bus port, PS-2 Port, SCSI port, PCI/MCI socket, Keyboard socket, Infrared port (IR), audio/speaker socket, Mic socket; data Bus; external storage devices connected using I/O ports;
  Keyboards : Qwerty, Inscript, Multilingual, Dvorak.
  Printers : Dot Matrix Printer, Line Printer, Deskjet / Inkjet / Bubblejet Printer, Laser Printer;
  Power Supply : Switched Mode Power Supply (SMPS): Elementary Concept of Power Supply : Voltage, Current, Power (Volt, Ampere, Watt), SMPS supplies – Mother Board.
  Power Conditioning Devices : Voltage Stabilizer, Constant Voltage Transformer (CVT), Uninterrupted Power Supply (UPS) – Online and offline.
  Note : Students should be asked to prepare a e-governance report of an organization describing the Computer System Configuration, Input Output Mechanism, Encoding scheme and Software Installation.

CLASS-XI (PRACTICAL)

Duration : 3 hours **Total Marks :** 30

1. **Programming in C++** **10**
   One programming problem in C++ to be developed and tested in Computer during the examination. Marks are allotted on the basis of following :
   Logic : 05 Marks
   Documentation / Indentation : 02 Marks
   Output presentation : 03 Marks
2. Project Work **05**
   (As mentioned in general guidelines for project, given at the end of the curriculum)
3. Practical File **05**
   Must have minimum 15 programs from the topics covered in class-XI course.
4. Viva Voce
   Viva will be asked from syllabus covered in Class-XI and the project developed by student.

CLASS-XII (THEORY)

Duration : 3 hours **Total Marks :** 70

Unit No.	Unit Name	Marks
1.	Programming in C++	30
2.	Data Structure	16
3.	Database and SQL	8
4.	Boolean Algebra	8
5.	Communication and Network concepts	8
		70

UNIT-1 : PROGRAMMING IN C++

REVIEW : C++ covered in Class-XI,
Defining a symbol name using typedef keyword and defining a macro using #define directive; Need for User defined data type;

- **Structures :** Defining a Structure, Declaring structure variables, Accessing structure elements, Passing structure to Functions as value and reference argument / parameter, Function returning structure, Array of structures, passing an array of structure as argument / a parameter to a function;
- **Object Oriented Programming :** Concept of Object Oriented Programming – data hiding, Data encapsulation, Class and Object, Abstract class and Concrete class, Polymorphism (Implementation of polymorphism using Function overloading as an example in C++); Inheritance, Advantages of Object Oriented Programming over earlier programming methodologies.
- **Implementation of Object Oriented Programming concepts in C++ :** Definition of a class, Members of a class – Data Members and Member Functions (methods), Using Private and Public visibility modes, default visibility mode (private); Member function definition : inside class definition and outside class definition using scope resolution operator (::); Declaration of objects as instances of a class; accessing members from object(s), Array of type class, Objects as function arguments – pass by value and pass by reference;

Constructor and Destructor :

Constructor : Special Characteristics, Declaration and Definition of a constructor, Default Constructor, Overloaded Constructors, Copy Constructor, Constructor with default arguments.

Destructor : Special Characteristics, Declaration and definition of destructor;

Inheritance (Extending Classes) : Concept of Inheritance, Base Class, Derived Class, Defining derived classes, protected visibility mode; Single level inheritance, Multilevel inheritance and Multiple inheritance, Privately derived, Publically derived and Protectedly derived class, accessibility of members from objects and within derived class(es);

- **Data File Handling :** Need for a data file, Types of data files – Text file and Binary file;
  Basic file operations on text file : Creating / Writing text into file, Reading and Manipulation of text from an already existing text File (accessing sequentially);
  Binary File : Creation of file, Writing data into file, Searching for required data from file, Appending data to a file, Insertion of data in sorted file, Deletion of data from file, Modification of data in a file;
  Implementation of above mentioned data file handling in C++;
  Components of C++ to be used with file handling :
  Header file : fstream.h; ifstream, ofstream, fstream classes;
  Opening a text file in **in, our,** and **app** modes;
  Using cascading operators for writing text to the file and reading text from the file; **open(), get(), put(), getline()** and **close()** functions; Detecting end-of-file (with or without using **eof()** function); Opening a binary file using **in, out,** and **app** modes;
  Open(), read(), write() and **close()** functions; Detecting end-of-file (with or without using **eof()** function); **tellg(),** tellp(), seekg(), seekp() **functions.**
  Pointers : Declaration and Initialization of Pointers; Dynamic memory allocation / deallocation operations; **new, delete;** Pointers and Arrays : Array of Pointers, Pointer to an array (1 dimensional array), Function returning a pointer, Reference variables and use of alias; Function call by reference, Pointer to structures : Deference operator : *, –>; self referencial structures;

UNIT-2 : DATA STRUCTURES

Arrays : One and two Dimensional arrays : Sequential allocation and address calculation;
One dimensional array : Traversal, Searching (Linear, Binary Search), Insertion of an element in an array, deletion of an element from an array, Sorting (Insertion, Selection, Bubble sort), concatenation of two linear arrays, merging of two sorted arrays.
Two dimensional arrays : Traversal, Finding sum / difference of two NxM arrays containing numeric values, Interchanging Row and Column elements in two dimensional array;

- **Stack (Array and Linked implementation of Stack) :** Operations on Stack (PUSH and POP) and its Implementation in C++, Converting expressions from INFIX or POSTFIX notation and evaluation of Postfix expression;
- **Queue (Circular Array and Linked Implementation) :** Operations on Queue (Insert and Delete) and its Implementation in C++.

UNIT-3 : DATABASES AND SQL

- **Database Concepts :** Relational data model : Concept of domain, tuple, relation, key, primary key, alternate key, candidate key;
  Relational algebra : Selection, Projection, Union and Cartesian product;
- **Structured Query Language :** General Concepts : Advantages of using SQL, Data Definition Language and Data Manipulation Language ;
  Data types : NUMBER, CHARACTER, DATE;
  SQL commands :
  CREATE TABLE, DROP TABLE, ALTER TABLE, UPDATE....SET...., INSERT, DELETE; SELECT, DISTINCT, FROM, WHERE, IN, BETWEEN, GROUP BY, HAVING, ORDER BY :
  SQL functions : SUM, AVG, COUNT, MAX and MIN;
  Note : Implementation of the above mentioned commands could be done on any SQL supported software.

UNIT-4 : BOOLEAN ALGEBRA

- Binary-valued Quantities, Boolean Variable, Boolean Constant and Boolean Operators: AND, OR, NOT Truth Tables; Closure Property, Commutative Law, Associative Law, Identity law, Inverse law, Principle of Duality, Idem potent Law, Distributive Law, Absorption Law, Involution law, Demorgan's Law and their applications;
  Obtaining Sum of Product (SOP) and Product of Sum (POS) form from the Truth Table, Reducing Boolean Expression (SOP and POS) to its minimal form, Use of Karnaugh Map for minimisation of Boolean expressions (up to 4 variables);
  Basic Logic Gates (NOT, AND, OR, NAND, NOR) and their use in circuits.

UNIT-5 : COMMUNICATION AND NETWORK CONCEPTS

- Evolution of Networking : ARPANET, Internet, Interspace;
  Different ways of sending data across the network with reference to switching techniques;
  Data Communication terminologies : Concept of Channel, Baud, Bandwidth (Hz, KHz, MHz) and Data transfer rate (bps, kbps, Mbps, Gbps, Tbps);
  Transmission media : Twisted pair cable, coaxial cable, optical fiber, infrared, radio link, microwave link and satellite link.
  Network devices : Modem, Rj45 connector, Ethernet Card, Hub, Switch, Gateway;
  Different Topologies – Bus, Star Tree; Concepts of LAN, WAN, MAN;
  Protocol : TCP / IP, File Transfer Protocol (FTP), PPP, Level-Remote Login (Telnet), Internet, Wireless / Mobile Communication, GSM, CDMA, WLL, 3G, SMS, Voice Mail, Application Electronic Mail, Chat, Video Conferencing;
  Network Security Concepts : Cyber Law, Virus threats and prevention, Firewall, Cookies, Hacking;
  WebPages : Hyper Text Markup Language (HTML), eXtensible Markup Language (XML); Hyper Text Transfer Protocol (HTTP); Domain Names; URL; Protocol Address; Website, Web browser, Web Servers; Web Hosting.

CLASS-XII (PRACTICAL)

Total Marks : 30

Duration : 3 hours

1. **Programming in C++**
   One programming problem in C++ to be developed and tested in Computer during the examination. Marks are allotted on the basis of following :

Logic	:	05 Marks
Documentation / Indentation	:	02 Marks
Output presentation	:	03 Marks

   Notes : The types of problems to be given will be of aplication type from the following topics.

- Arrays (One dimensional and two dimensional)
- Array of structure
- Stack using arrays and linked implementation
- Queue using arrays (circular) and linked implementation.
- Binary File Operations (Creation, Displaying, Searching and modification)
- Text-file operations (Creation, Displaying and modification). **05**

2. **SQL Commands**
   Five Query questions based on a particular Table / Reaction to be tested practically on Computer during the examination. The command along with the result must be written in the answer sheet. **05**

3. **Project Work**
   The project has to be developed in C++ language with Object Oriented Technology and also should have use of Data files.

- Presentation on the computer
- Project report (Listing, Sample, Outputs, Documentation)
- Viva

4. **Practical File** 05

Must have minimum 20 programs from the following topics –

- Arrays (One dimensional and two dimensional, sorting, searching, merging, deletion & insertion of elements)
- Arrays of structures, Arrays of Objects
- Stacks using arrays and linked implementation
- Queues using arrays (linear and circular) and linked implementation.
- File (Binary and Text) operations (Creation, Updation, Query)
- Any computational based problems

15 SQL commands along with the output based on any table / relation : 3 Marks

5. **Viva Voce** 05

Viva will be asked from syllabus covered in class-XII and the project developed by student.

GUIDELINES FOR PROJECTS (Class XI and XII)

1. **Preamble**

1.1 The academic course in Computer Science includes one Project in each year. The Purpose behind this is to consolidate the concepts and practices imparted during the course and to serve as a record of competence.

1.2 A group of two students/three students as team may be allowed to work on one project.

2. **Project content**

2.1 Project for class XI can be selected from one of the topics given in event programming (or)

2.2 Project for class XII should ensure the coverage of following areas of curriculum:

a. Problem Solving
b. Data Structure
c. Object Oriented Programming in C++
d. Data File Handling

Theme of the project can be

- Any subsystem of a System Software or Tool
- Any Scientific or a fairly complex algorithmic situation.
- Business oriented problems like Banking, Library information system, Hotel or Hospital management system, Transport query system
- Quizzes/Games;
- Tutor/Computer Aided Learning Systems

2.3 The aim of the project is to highlight the abilities of algorithmic formulation, modular programming, optimized code preparation, systematic documentation and other associated aspects of Software Development.

2.4 The assessment would be through the project demonstration and the Project Report, which should portray Programming Style, Structured Design, Minimum Coupling, High Cohesion, Good documentation of the code to ensure readability and ease of maintenance.

Reference Books

Computer Organisation and Boolean Algebra

1. Rajaraman, FUNDAMENTALS OF COMPUTERS 4th Edition, Prentice Hall of India.
2. Peter Norton, INTRODUCTION TO COMPUTER 4th Edition, Tata McGraw Hill
3. J. Shelly & Roger Hunt, COMPUTER STUDIES, Wheeler's Publication.

MULTIMEDIA & WEB TECHNOLOGY

For Class-XI

Learning Objectives :

1. To get proficient in WEB Development using HTML/XML.
2. To be able to write server & client scripts.
3. To get proficient in Web Management.
4. To get proficient in creating Web site.
5. To design Graphical images using Image-Editing tools.
6. To get proficient in audio&video capture and editing using software tools.
7. To create and publish a self-contained multimedia CD-ROM using multimedia authoring tool.
8. To develop ability to use the open source technology.
9. To develop ability to localize software applications.

Competencies :

The student will become proficient in the following :

1. Managing Self Developed Web-site.
2. Management of a full-fledged web portal.
3. Creation & Edition of graphical images.
4. Capturing, Creating and Editing Audio and Video through external devices.
5. Embedding images & video into a presentation.

CLASS-XI (THEORY)

Duration : 3 hours

Total Marks : 70

Unit No.	Unit Name	Marks
1.	Computer System	15
2.	Web Development	25
3.	Web Scripting	20
4.	Multimedia and Authoring Tools	10
		70

UNIT-1 : Computer System

- Introduction to Computer, Input Devices – Keyboard, mouse, Joy stick, Mic, Camera, Output Devices – Monitor, Printer, Speaker, Plotter; Memory Units – Byte, Kilobyte, Megabyte, Giga byte, tera byte; Primary Memory – RAM and ROM; Secondary Storage devices – Floppy Disk, Hard disc, CD ROM, DVD, Zip Drive, DAT Drive; Power devices – UPS; Software – System Software, Application Sofware, Utility Software; Working on computers – switching on computer, booting-computer; icons, shortcuts, taskbar, mouse pointer; typing, saving and printing a simple text file, drawing simple picture using MSPaint, using calculator option, customizing desktop, windows explorer, managing folders (creating, moving, deleting, renaming); using floppy disk drive, using CD/DVD drives; managing files (copying, moving, deleting, renaming); playing audio and video;

GUI Operating System–

- **Important :** Students / Teachers can also perform similar operation on any operating system. It is advised that the teachers while using any one operating system, give a demonstration of equivalent features for the other operating system.

Windows–

- **General features, Elements of Desktop :** Taskbar, Icon, Start button, Shortcuts, Folder, Recycle Bin, My Computer;

Start Menu : Program, Documents, Setting, Find / Search, Help, Run, ShutDown / Logoff; Customization of Taskbar, Start menu, Display properties (Wallpaper, Font Settings, Colour Settings, Screen Savers).

Program Menu : Accessories – Calculator, Notepad, Paint, Word Pad, Entertainments (CD Player, Sound Recorder, Media Player, Volume Controller);

Browsers : Mozila Firefox, Internet Explorer, Netscape Navigator;

Control Panel : Add new hardware; Add new Software, Printer Installation, Date / Time, Mouse and Regional Settings;

Documentation –

- Purpose of using word processing software, opening a new / existing document, closing a document, typing in a document, saving a document, print preview, printing a document, setting up of page as per the specifications, selecting a portion of document, copying selected text, cutting selected text, pasting selected text; changing font, size, style, colour of text; Inserting symbol; Formatting : Alignment – Left, Right, Center; Justification;

UNIT-2 : Web Development

- WebPages; Hyper Text Transfer Protocol (HTTP); File Transfer Protocol (FTP) Domain Names; URL; Protocol Address; Website, Web browser, Web Servers; Web Hosting.

HTML / DHTML –

Introduction, Objectives, Introduction to Universal Resource Identifier (URI) – Fragment Identifiers and Relative URI's, History of HTML, SGML, Structure of HTML/DHTML Document, Switching between opened Windows and browser (Container tag, Empty tag, Attribute);

Basic Tags of HTML : HTML, HEAD, TITLE, BODY (Setting the Fore Colour and Background colour, Background Image, Background Sound), Heading tag (H1 to H6) and attributes (ALIGN), FONT tag and Attributes (Size : 1 to 7 Levels, BASEFONT, SMALL, BIG, COLOUR), P, BR, Comment in HTML (<!>), Formatting Text (B, I, U, EM, BLOCK QUOTE, PREFORMATTED, SUB, SUP, STRIKE), Ordered List – OL (LI, Type – 1, I, A, a; START VALUE), Unordered List - UL (Bullet Type – Disc, Circle, Square, DL, DT, DD), ADDRESS Tag;

Creating Links : Link to other HTML documents or data objects, Links to other places in the same HTML documents, Links to places in other HTML documents;

Anchor Tag <A HREF> and <A NAME>, Inserting Inline Images <IMG ALLIGN, SRC, WIDTH, HEIGHT, ALT, Image Link, Horizontal Rules <HR ALIGN, WIDTH, SIZE, NOSHADE>;

Web Page Authoring Using HTML

Tables : Creating Tabels, Border, TH, TR, TD, CELLSPACING, CELLPADDING, WIDTH, COLSPAN, CAPTION, ALIGN, CENTER;

Frames : Percentage dimensions, Relative dimensions, Frame – Src, Frameborder, height and width, Creating two or more rows Frames <FRAMESET ROWS>, Creating two or more Columns Frames <FRAMESET COLS>, <FRAME NAME SRC MARGINHEIGHT MARGINWIDTH SCROLLING

AUTO NORESIZE>, <NOFRAMES>, </NOFRAMES>;
Forms : Definitions, Use – Written to a file, Submitted to a database such as MS Access or Oracle, E-mailed to someone in particular, Forms involve two-way communication;
Form Tags : FORM, <SELECT NAME, SIZE, MULTIPLE / SINGLE> <OPTION> ... </SELECT>, <TEXT AREA NAME ROWS COLS>,, </TEXTAREA>, METHOD, CHECKBOX, HIDDEN, IMAGE, RADIO, RESET, SUBMIT, INPUT <VALUE, SRC, CHECKED, SIZE, MAXLENGTH, ALIGN>;

Document Object Model

- Concept and Importance of Document Object Model, Dynamic HTML documents and Document Object Model.

Cascading Style Sheets
Introduction to Cascading Style Sheet (CSS), three ways of introducing the style sheets to your document, Basic Syntax; Creating and saving cascading style sheets, <STYLE> tag.
Examples showing the linking of external style sheet files to a document; Inline and Embed, <DIV> tag; COLOUR, BACKGROUND-COLOUR, FONT-FAMILY, FONT-STYLE, FONT-SIZE and FONT-VARIANT; FONTWEIGHT, WORD-SPACING, LETTER-SPACING, TEXTDECORATION, VERTICAL-ALIGN, TEXT-TRANSFORM; TEXT-ALIGN, TEXT-INDENT, LINEHEIGHT,
Introduction to Margin, Padding and Border;
MARGINS (all values), MARGIN-PROPERTY, PADDIND (all values), PADDINGPROPERTY; BORDER (all values), BORDER-PROPERTY, BACKGROUND IMAGE, BACKGROUND REPEAT;
Additional Features, Grouping Style Sheets, Assigning Classes; Introduction to Layers, <LAYER>, <ILAYER> tag;

eXtensible Markup Language (XML)

- XML : Introduction;

Features of XML : XML can be used with existing protocols, Supports a wide variety of applications, Compatible with SGML, XML, documents are reasonably clear to the layperson;
Structure of XML : Logical Structure, Physical Structure;
XML Markup : Element Markup i.e. (<foo>Hello</foo>), Attribute Markup i.e. (<!element.name property="value">);
Naming rules : used for elements and attributes, and for all the descriptors, Comments Entity
Declarations :<! ENTITY name "replacement text">;
Element Declarations : <!ELEMENT name content>;
Empty Elements : <!ELEMENT empty.element EMPTY>;
Unrestricted Elements: <!ELEMENT any .element ANY>;
Element Content Models : Element Sequences i.e. <!ELEMENT couting (first, second, third, fourth)>,
Element Choices <!ELEMENT choose (this.one | that.one)>, Combined Sequences and Choices;
Element Occurrence Indicators : Discussion of Three Occurence Indicators
? (Question Mark)
* (Asterisk Sign)
+ (Plus Sign)
Character Content : PCDATA (Parseable Character data) <!ELEMENT text (#PCDATA), Document Type Declaration (DTD) and Validation;
Developing a DTD : Modify an existing SGML DTD, Developing a DTD from XML Code, either automatically or manually;
Viewing XML in Internet Explorer, Viewing XML using the XML Data Source Object, XSL (Extensible Style Sheet Language) or CSS (Cascading Style Sheet);

UNIT-3 : Web Scripting

VBScript

- Introduction, Adding VBScript code to HTML Page, VBScript Data type-Variant subtypes, VBScript Variables : (Declaring variable, Naming restrictions, Assigning value to variables, Scalar variables and 1-D Array), VBScript Constants, VBScript Operators, and Operator precedence :

MsgBox : functions of message box (Prompt, Buttons, Title, Helpline, Context), Return values of MsgBox function, button argument setting.
Conditional statements : If..Then.. Else, Select case;
Loops : Do loops, While.. Wend, For.. Next, For..Each..Next;

VBScript variables : Sub procedures, Function procedures;
Using VBScript with HTML form controls, Data handling functions, String functions, Date and Times functions;

UNIT-4 : Multimedia and Authoring Tools

- **Graphics Devices :** Monitor display configuration, Basics of Graphics Accelerator Card and its importance;

Basic concepts of Images : Digital Images and Digital Image Representation
Image Formats : TIFF, BMP, JPG / JPEG, GIF, PIC, PDF, PSD;
Theory of design, form, line, space, texture, color, typography, layout, color harmony, unity, balance, proportion, rhythm, repetition, variety, economy, still life, light and shade, Poster Design; Still life, colored layout, Poster Design, Designing of Books, magazines, brochures, children's literature, narrative illustrations, conceptual illustrations, handling of assignment for the market.
Image Scanning with the help of Scanner : Setting up Resolution, Size, File formats of images; image preview, Bitonal, Grey Scale and Color options; Significance of PDF-creation, modification; Animation, Morphing and Applications.
Graphic Tools : Image Editing Software (Photoshop / Coreldrw)
Basic Concepts : An Introduction, creating, Opening and saving files, Menus, Toolbox, Color control icons, Mode control icons, Window controls icons; creating new images, Image capture (TWAIN) from scanner other files;
Image Handling : Cropping an image, adjusting image size, increasing the size of the work canvas, saving an image;
Layers : Adding layers, dragging and pasting selections on to layers, dragging layers between files, viewing and hiding layers, Editing layers, rotating selections, scaling an object, preserving layers transparency, moving and copying layers, duplicating layers, deleting layers, merging layers, using adjustment layers;
Channels and Masks : Channel palette, showing and hiding channels, splitting channels in to separate image, merging channels, creating a quick mask, editing masks using quick mask mode;
Painting and Editing : Brushes palette, brush shape, creating and deleting brushes, creating custom brushes, setting brush options, saving, loading and appending brushes, Options palette;
Opacity, Pressure, or exposure, paint fade-out rate, making selections, using selection tools, adjusting selections, softening the edges of a selection, hiding a selection border, moving and copying selection, extending and reducing selections, pasting and deleting selections, Image tracing (CorelDrw)
Concept of Multimedia : Picture / Graphics, Audio, Video;
Sound : Recording Sound using Sound Recorder (Capture), Sound capture through sound editing software (ex : Sound forge), Sound editing, Noise correction, Effect enhancement;
Voice Recognition Software Philips / Dragon, MIDI Player, Sound Recorder, MONO & Stereo, Sound File Format : AIFF (Audio Input File Format from Apple Mac), MIDI, WAV, MP3, ASF (Streaming format from Microsoft).
Importing audio and saving audio from Audio CD.
Sound Quality : CD Quality, Radio Quality, Telephone Quality;

MULTIMEDIA AND WEB TECHNOLOGY
CLASS-XI (PRACTICAL)

Duration : 3 hours **Total Marks :** 30
15

1. **Hands on Experience**
   A topic based homepage has to be to be developed by each student using various commands covered in HTML and VBScript.
   Web page should be designed with following features :
- HTML Basic Tags (html/head/title/body/B/I/U/BR/HR)
- Anchor/Image insertion/Linking
- Tables/Frame/Form
- CSS

- XML Markup / Declarations / Element Content Model
- Element Occurrence Indicators
- Buttons / Combo Box / Check Box / Text Box using VBScript

2. **Practical File with following case studies** 15
The practical file should be made on the following domain specific area (with supported documents and printout)

- Make a web page for Crime against Poor Community.
- Link few more pages to the developed page, containing information about Crime and Steps taken by Government. (Use HTML tags to make a Static Web page)
- Use inline styling to change appearance of contents of the web page.
- use Style sheets (embedding or linking) to change the appearance of all the pages developed in the above case.
- Enhance the above web page by providing data in sheet format.
- At this step of web page development add dynamic features such as adding time and current data to the web page.
- Collect user inforamtion using forms, for registration. Display the collected user details using message box, saying thank you for registration. (Use VB Script)

Case Studies :

(These case studies can also be used to experiment the concepts learned during the course. Knowledge domain : HTML, DHTML, CSS, VB Script and Image Editing Software's)

1. Website of a student containing personal information about student such as email address, photograph, likes, dislikes, hobbies, class, school name, achievements, favorite restra, favorite tourist places, ultimate aim of life, message to mankind, role model.
2. Websiste of a School providing information of a school containing Moto of school, photograph of school, beif description of school, name of the principal, facilities and infrastracture, labs, sports, faculty and departments information, results and achievements of students.
3. Website of a Restaurant providing information about types of food items, brief description about each item with pictures, price list, and availability timings.
4. Website of a Travel Agency to provide the information about various tourist places, various modes of journey, types of hotels available.

Note :

- For developing the website collect real information from various sources.
- It is advised to break up the above-mentioned case studies into smaller modules as per coverage of the course.
- Teachers can provide alterantive case studies also of similar kind.

3. **Viva Voce** 05
Five questions from topics covered in the curriculum.

MULTIMEDIA AND WEB TECHNOLOGY

CLASS-XII (THEORY)

Duration : 3 hours **Total Marks :** 70

UNIT-1 : Computer System

- Database Terminology : Data, Record / Tuple, Table, Database
- Concept of Keys : Candidate Key, Primary Key, Alternate Key, and Foreign Key.
- Database Tool : Using MS– Access, Creating and Saving Table, Defining Primary Key, Inserting and Deleting Column, Renaming Column, Inserting records, Deleting Records, Modifying Records and Table Relationship.

UNIT-2 : Web Technologies

- **Communication and network concepts :**
  Evolution of Networking : ARPANET, Internet, Interspace;
  Different ways of sending data across the network with reference to switching techniques;
  Data Communication terminologies : Concept of Channel, Baud, Bandwitch (Hz, KHz, MHz) and Data transfer rate (bps, kbps, Mbps, Gbps, Tbps);
  Transmission media : Twisted pair cable, coaxial cable, optical fiber, infrared, radio link, microwave link and satellite link.
  Network devices : Modem, RJ45 connector, Ethernet Card, Hub, Switch, Gateway;
  Different Topologies : Bus, Star, Tree; Concepts of LAN, WAN, MAN;
  Protocol : TCP / IP, File Transfer Protocol (FTP), PPP, Level-Remote Login (Telnet), Internet, Wireless / Mobile Communication, GSM, CDMA, WLL, 3G, SMS, Voice mail, Application, Electronic Mail, Chat, Video Conferencing;
  Network Security Concepts : Cyber Law, Firewall, Cookies, Hackers and Crackers.
- **Introduction to Open Source based software**
  Terminology : OSS, FLOSS, GNU, FSF, OSI, W3C
  Definitions : Open Source Software, Freeware, Shareware, Proprietary software, Localisation, UNICODE
  Softwares : Linux, Mozilla web browser, Apache server, MySQL, Postgres, Pango, OpenOffice, Tomcat, PHP, Python
  Websites : www.sourceforge.net, www.openrdf.org, www.opensource.org, www.linux.com, www.linuxindia.net, www.gnu.org.
- **Multimedia Appplication :** Education (use of CAI tool), Entertainment, Edutainment, Virtual Reality, Digital Libraries, Information Kiosks, Video on Demand, Web Pages Video phone, Video conferencing and Health care.

UNIT-3 : Web Development

- Review OF HTML / DHTML, VBScript covered in Class-XI.
  Installation and Managing WEB-Server : Internet Information Server (IIS) / Personal Web Server (PWS).
  Active Server Pages (ASP) : Concept of ASP, features of ASP, other equivalent tools – JSP, PHP;
  Constants : String and Numeric;
  Data types : Integer, Floating Point (Single, Double), String, Data, Boolean, Currency, Variant, Object;
  Variables : Explicit and Implicit Declaration;
  Operators :
  Arithmetic : +, – (Unary and Binary), *, /, \ (integer division) mod, ^;
  Comparison : <, >, <=, >=, <>, =;
  Logical : AND, OR, NOT, XOR, EQV, IMP,
  String Operator : & or + (for Concatenation);
  Functions :
  Conversion functions : Abs(), CBool(), CByte(), CInt(), CStr(), CSng(), Clng(), CDate();
  String Manipulation Functions : UCase(), LCase(), Len(), Left(), Right(), Mid(), LTrim(), InStr(), RTrim(), LTrim();
  Time&Date Functions : Date(), Day(), Hour(), Left(), Len(), Minute(), Month(), Monthname(), Now();
  Arrays : Declaration and use of 1 dimensional arrays;
  Controls : IF..THEN, IF.. THEN..ELSE..END IF, IF..THEN.. ELSEIF.. THEN.. END IF, SELECT..CASE..END SELECT, FOR..NEXT, FOR EACH.. NEXT, DO WHILE..LOOP, DO..LOOP WHILE, DO UNTIL . LOOP;
  Procedures and functions, Passing parameters / arguments;
  Concept of object model structure (client to server and server to client);
  Objects : Properties, Methods, Events, Setting Object properties, Retrieving Object properties, calling objects / methods;

Types of Objects : Response, Request, Application, Session, Server, ASPError;
Response Object : Write Method, AddHeader, AppendToLog, BinaryWrite, Using Shortcuts <%=value/expr%>, Controlling information : Buffer, Flush Clear, End;
Request Object : Request Object Collection : QueryString, Form, ServerVariables, Cookies, ClientCertificate;
Application : Contents, Lock, Unlock, Remove, RemoveAll;
ASP Components : AD Rotator, Content Rotator, Counter, Page Counter, Permission Checker;
Text Files : Open and Read content from a text file;
Elementary Database Concepts : Concept of Table / Relation, Relationship, Candidate Key, Primary Key, Alternate Key, Foreign Key, Connecting with Databases : Creation of DSN, using OLE DB
Working on Database : Inserting, Retrieving, Modifying / Updataion of records from Tables in Databases using server objects (ADODB. Connection, ADODB, Recordset).
Server Variables : HTTP_User_Agent, REMOT_ADDER, REMOTE_HOST, SERVER_NAME;

UNIT-4 : Multimedia and Authoring Tools

- **Movie File Formats :** AVI, MPEG, SWF, MOV, DAT;

Movie Frames : Concept of Frame, Frame Buffer, and Frame Rate ;
Authoring Tools; Making Animation, Embedding Audio / Video, and Embedding on the web page;
Multimedia Authoring Using Macromedia Flash
Making of Simple Flash Movie, Setting Properties, Frame Rate, Dimensions, and Background Color;
Scene : Concept of Scene, Duplicate Scene, Add Scene, Delete Scene, and Navigating between Scenes;
Layers : Concept of Layer, Layer Properties, Layer Name, Show / Hide / Lock layers, Type of Layer - Normal / Guide / Mask, Outline Color, Viewing Layer as outline, Layer Height, Adding / deleting a layer;
Frame : Concept of Frame;
Creating a Key Frame, Inserting Text Into the Frame, Inserting Graphical Elements into the frame, Converting Text / Graphics to Symbol, Inserting Symbol into the Frame, Setting Symbol Property (Graphics / Button / Movie), Inserting Blank Frame, Inserting Blank Key Frame, Inserting Key Frame into the Blank frame, Selecting all / Specific frames of a Layer, Copying / Pasting selected Frames,
Special Effects : Motion Tweening, Shape Tweening, Color effect, Inserting Sound Layer;
Testing a Scene and Movie;
Import / Export (Movie / Sound and other multimedia objects)
Publishing : Publishing A Flash Movie; Changing Publish settings : Producing SWF (Flash Movie), HTML page, GIF image, JPEG Image (*.jpg), PNG Image, Windows Projector (*.exe), Macintosh Projector (*.hqx), Quick Time (*.mov), Real Player (*.smil);
Testing with Publish Preview

MULTIMEDIA AND WEB TECHNOLOGY
CLASS-XII (PRACTICAL)

Duration : 3 hours **Total Marks :** 30

1. Hands on Experience 15

A website based on a particular topic has to be developed by each student using various commands covered in HTML, VBScript and ASP with at least 4 web pages.

Web page should be designed with following features.

- HTML Basic Tags (html/head/title/body/B/I/U/BR/HR)
- Functions
- Conditional and Control Statements
- Objects : Response / Request / Application
- Session / Server / ASP error
- Image Editing using Photo Shop / Corel draw
- Merging layers / Moving and Copying Layers
- Use of Multimedia Authoring (Using Macromedia Flash)

(Note : Output as Web page / Flash Movie / Windows Projector / Quick Time)