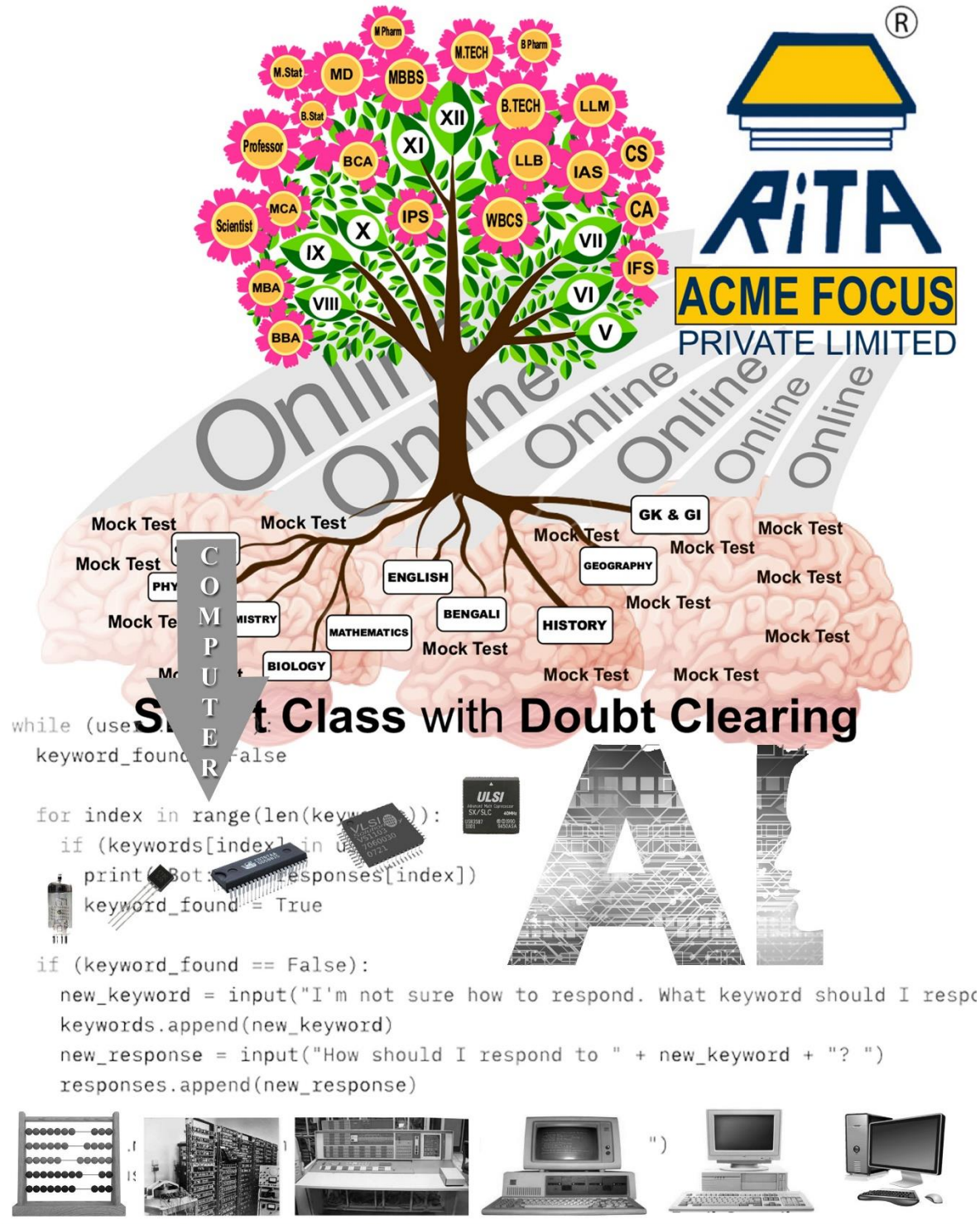


# Career Elevator:

www.rita-acmefocus.com

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**COMPUTER**

Computers have become essential in daily life due to their ability to provide a vast range of important functions and services, including Communication, Entertainment, Education, Industry, Infrastructural development and office-related tasks. The use of computers has increased efficiency and productivity creating numerous new opportunities for research and scientific advancement.
Computers provide ways to communicate with people around the world including email, video conferencing, social media, and instant messaging.
The digital transformation of Indian higher education holds immense potential to revolutionize learning experiences, empower educators and prepare students for the future.
Modern life without a computer is unthinkable. So RITA ACME FOCUS [RAF] took initiative in 2005 to make computer easy and friendly by introducing School Level Computer courses like C, C++, JAVA, PYTHON etc. under the roof of Sovabazar Youth Computer Training Centre, approved by Govt. of West Bengal. To be at par with the fast upcoming era of Artificial Intelligence, RAF has decided to promote the Online Mock Test system of e-Learning mode especially. Thus we want to lay the FOCUS of indomitable warriors of future generation in both academic and professional fields who will be bringing glory to our State as well as our Motherland.

**SYLLABUS:**

**Class V**

**(A) History of Computer:**

Early calculating devices, Evolution of Computer, Uses of Computer, Features of Computer, Benefits & Limitations of Computer.

**(B) Know Your Computer:**

Hardware & Software, Categorization of Hardware (Input, Output Devices), Computer Memory (Detailed Primary & Secondary Memory), Categorization of Software (Definition of System & Application Software).

**(C) Computer Software & Categorization of Computers:**

System Software (Short description of different types of System Software), Application Software(Short description of different types of Application Software); Types of Computers: Working Principle and Data Handling Abilities; Types of Digital Computers: Based on Storage Capacity, Size, Processing Power.

**(D) Windows OS:**

Interfaces of Computer, Definition & Features of Windows, Components of Windows; DetailedFile & Folder.

**(E) Introduction to Microsoft Office Word:**

Introduction of Word, Starting Word, Features of Word, Components of Word Window, Creating, Saving, Closing, Opening, Printing, Clipboard Group, Font
Group of Home Tab.

**(F) More Features of Word:**

Paragraph Formatting, Pages Group, Picture (From file & Online Pictures), Shapes, SmartArt Graphics, Charts, Text Box, WordArt, Symbols, Page Formatting (Page Color, Page Borders).

**(G) Introduction to Microsoft Office PowerPoint:**

Introduction of PowerPoint, Starting PowerPoint; Creating (Home Tab, Tables, Images, Illustrations and Symbols group of Insert Tab), Saving, Opening, Presenting and Closing Presentation.

**(H) Scratch:**

Introduction, Components, Blocks Details, Changing costume, background, Different options fornew sprite.

**(I) Internet & Email:**

Introduction, Requirements of connection, WWW, Website, Webpage, Home Page, URL, Hyperlink, Hypertext, Web Browser, Search Engine, Uses of Internet, Netiquettes, Introduction of Email, Advantages & Disadvantages, Email Account, Components of Email Account, Accessing Email Account.

## Class VI

**(A) Advanced Features of Word:**

Styles & Editing Group of Home Tab, Tables, Links and Header & Footer group of insert Tab, Drop Cap, Date & Time, Object, Equation, Themes, Page Setup, Watermark, Mail Merge, Proofing Group, View Tab.

**(B) Advanced Features of Presentation:**

Links, Text, Symbols Group of Insert Tab, Action Button, Creating Presentation using Template, Applying Theme, Formatting Background, Page Setup, Applying Transition and Animation, Slide Show, Rehearse Timing, Presentation Views, Slide Master View, Fit to Window.

**(C) Introduction to Microsoft Office Excel:**

Definition of Spreadsheet & Excel, Components of Excel
Windows, Data Entry, Data type, Alignments, Text Orientation, Inserting & deleting rows, columns, cells, sheets, changing row height and column width, Merge & Unmerged cells; Applying border and shading color, Copy, Cut, Paste Data, Definition of function and formula, Some basic functions like Sum, Average, Max, Min, Count.

**(D) Operating System:** Definition, Functions, Types of OS based on Working Principles and Platforms, Booting process, Shutting Down process.

**(E) Computer Language:** Categorization based on Generations, Programming Languages, Language Translator, Source & Object Code.

**(F) Robotics & AI**.

**(G) Introduction to Animate CC:**

Starting Adobe Animate CC, Creating Documents, Components of Animate CC Window; Saving a Document, Creating Shapes, Gradient Fill; Creating Symbols; Creating a Motion Tween; Creating a Classic Tween; Creating a Shape Tween; Working with Layers; Using Masking; Formatting Text.

**(H) Introduction to HTML:**

Definition of HTML, Tags & Element, HTML Text Editor, Types of Tags, Basic Tags (HTML, Head, Title, Body, Heading Tags, BR, P, B, I, U, SUP, SUB, HR, FONT) with their Attributes.

**(I) Introduction to Programming QB64:**

Definition of Programs, Programmer, Programming, BASIC, QBASIC, Variables, Constants, Print Statement (with comma, with semicolon, with tab), CLS, REM, INPUT, LET, Types of Variables & Constants, Rules for Naming

different types of variables, Creating, Saving, Executing and Closing Programs, LET and INPUT Programs

**Class VII**

**(A) More About Excel:**

Wrap Text, Shrink to Fit, Number Formatting, Conditional Formatting, AutoSum, Auto Fill, Fill Handle, Hide & Unhide Rows, Columns & Sheets, Renaming Sheets, Sort & Filter Data, Creating Charts, Errors in Excel, Functions (Logical, Date & Time, Text, Count, Math & Trigo). Home Tab, Insert Tab, Formula tab, Page Layout Tab, Data Tab, Review Tab, View Tab
Conditional & Iteration, String Programs in QB64: Read and Data Statement, Operators, Conditional & Iteration Programs, String Programs, Math & String Functions.

**(B) Memory Measurements:**

Bit, Bytes, KB, MB, GB, TB etc. LSB, MSB
Number System: Definition of Binary, Decimal, Octal, Hexadecimal, Base; All types ofConversion (with decimal points), Binary Addition & Subtraction (with decimal points) Algorithm & Flowchart: Definition, Characteristics, Advantages & Disadvantages of Algorithm & Flowchart, Symbols of Flowchart, Writing Algorithm and Drawing Flowcharts

**(C) App Development:**

Definition of App, Definition of Android & iOS, Types of Mobile App, Categories of apps, Downloading & Installing App, Developing an App; Internet Services: Social Networking, Skype, Quora, E-Banking, Newsgroup, Blogging, Cloud Computing, RSS, Podcasting, All Google Apps

**(D) Networking:**

Definition of Network, Networking Devices, Web Server, Client, Web Portal, Protocols, Advantages & Disadvantages, Internet, Intranet, WWW, Website, Webpage, Home Page, URL, Hyperlink, Hypertext, Web Browser, Search Engine, Topology, Architecture, IP Address, DNS,
Letter Addressing, Netiquettes, Emoticons, E-mail, HTML

**(E) DBMS:**

Concept of database, Advantages & disadvantages of database, Types of databases, Terms related to data base;
Access: Introduction to Access, Components of Access; Creating database; Data types in Access; Types of views; Rules for writing a field name in Access; Creating a table, Opening existing database, Forms, Reports, Queries, Existing Access.

**(F) Malware & Virus:**

Malware, Virus, Different types of Viruses & Malwares; Symptoms; Reason;

Prevention of Virus Attack; Anitivirus Software; Firewalls Ethics & Safety Measures in Computing: Definition of Computer Ethics, Unethical Practices, Safety measures while using Internet, Digital Footprints.

**(G) More on HTML:**

Creating List, Table, Links, Form, Frame, Scrolling Text, Inserting Image, Linking, Form, Frame Introduction to C: Introduction, Data types, Variables, Basic Programming, Input Statements,
Operators, Escape Sequences

**(H) QBASIC- Functions and Subroutines**

More on C: Conditional, Switch, Loop, Nested loop, Jump Statement, Array, Structure, Union,
Enumeration, Function, Recursion

**(I) QBASIC- Graphics**

Introduction to Python: Character Set, Data types, Tokens, String Types – Single and Multiline, Literals, Operators, Comments, Multiple Assignments, Escape Sequences, input () and print ().

**CLASS VIII**

**(A) Introduction to Software:**

Computer Software & it's types- Application software (General purpose, Word Processing, Graphic & Multimedia software) System Software (Operating System & its functions, language processor, Utility Software.) Special Purpose Application software. Operating System (OS) and Graphical User Interface (GUI) – Role and functions Introduction, necessity, features, and classification of operating systems. Definition and examples of single users. Meaning and types of user interfaces (CUI, GUI). Description of GUI and its benefits. Introduction to spreadsheet: Workbook, worksheet, Components of spreadsheet, Creating, saving, editing cell content.

**(B) MS Access**:

Database, Rdbms, Structure of dbms, create database, Views of table, Datatypes, Table creation, modify table, Sort and filter More on access Tables, Query, Forms, Report Spreadsheet - Functions and Charts: Method to enter formulae, Meaning of Range, selecting range, naming a range. Cell referencing and its types (relative, absolute, mixed - with examples). Naming, renaming and deleting a sheet from sheet tab. Meaning of Functions; Rules to enter a function like Sum, Average, Max, Min, count, Auto fill, Freeze/Unfreeze Rows and Columns. Formatting cell content etc. Advanced features of Microsoft PowerPoint Customize Slide design, Slide Master, using audio and video, recording narration, exporting to MP4, PDF and other file formats Working with Notes, Slide Size, Creating PowerPoint Theme, working with Master Views and Presentation Views Using Presenter View.

**(C) Introduction to Adobe Photoshop cc:**

Features of Photoshop cc, Tools in Photoshop, painting tools, Saving, opening a Photoshop file, Move and selection tools, inserting text, closing and exiting Photoshop. More on Photoshop layers in Photoshop, painting tools, drawing tools, shapes tool, Image menu. Layers as smart object Number system: Types of Number Systems, what is base, MSB, LSB, Binary, Decimal, Octal, Hexadecimal, Number System Conversion, binary addition, subtraction. Introduction to Program Coding: Introduction to Program coding / programming. Component of a program: identifiers, their naming rules. Literals (like integer, real and string). Data types and the need for different data types (like int, char, float, etc.) Declaration and initialization of variables, Arithmetic operators (+, -, *, /, %), relational and logical operators. Assignment operator and its use; Compiling and executing programs. Concept, use and syntax of if, if else, if else if ladder.

**(D) Computer safety and security:**

How to keep your computer physically feet? How to back up? Protecting your computer from illegal access, Other maintenance technique Computer Virus About computer virus, Types of virus, Protect the computer, About antivirus software. Networks: Definition of Network and its components (sender, receiver, medium); Definition of different types of networks with examples (LAN, MAN, WAN, PAN, CAN). Meaning of various terms related to internet: Intranet, URL, ISP, IP address, DNS, webpage, website, web portal, MODEM, switch, hub, router, gateways, link, hyperlink, hypertext, band width. Definition of protocol (HTTP, FTP, TCP/IP, IMAP, SMTP - a brief explanation of each and their purpose). App Development Introduction to apps - Working of apps. Uses of some commonly known apps. Type of apps: web or online, mobile; Development of simple apps (using any free app development software).

**(E) Cloud computing:**

Cloud computing, Characteristics of cloud computing, Advantages and disadvantage of cloud computing. Storing and sharing data using cloud computing. Online file sharing, Internet banking, E shopping Internet surfing: World wide web, Multimedia/Real time communication, skype/blog. Latest technological Developments Artificial intelligence, Augmented reality and virtual Reality,3d printing, Block chain Internet of things, RPA (Robotic Process Automation) HTML Introduction to Html, Types of editor, Basic tags in Html, Types of tag in Html Programs using basic tags.

**(F) More on Html**

Bullets, table, links in Html, forms Image insert, Frame, Forms in Html Algorithms and Flow Charts Introduction to algorithm - definition and its use; Characteristics of a good algorithm. Steps to develop an algorithm. Writing algorithms. Definition of flowcharts. Various symbols used in flowcharts. Solving problems by writing algorithms and drawing flowcharts till decision making. (excluding loops). Programing with C++ Introduction, structure of C++ language. Identifiers, Data types& variables, Constants& Operators, Working with Conditional statement, Loops, Switch statement.

**(G) More on C++ language:**

Array, 2D Array, Constructor, Destructor, Function Overloading Introduction to Python Programming Features of Python, Types of mode, Input, output, Print variables, Datatypes, Operators Conditional statement in python Decision making statements, If else ladder Loops in python for statement, While statement, More programs Functions and String in Python Functions, String.

**(H) Introduction to Java and blue j**

Basics of programming, Operator, datatypes, mathematical expression. Principles of Object Oriented Programming, (Difference between Procedure Oriented and Object-oriented). All four principles of Object-Oriented Programming should be defined and explained using real-life examples (Data abstraction, Inheritance, Polymorphism, Encapsulation); Types of Java programs

– Applets and Applications, Java Compilation process, Java Source code, Byte code, Object code, Java Virtual Machine (JVM), Features of JAVA. Values and data types: Character set, ASCII code, Unicode, Escape sequences, Tokens, Constants and Variables, Data types, type conversions. Escape sequences [\n, \t, \\, \", \'], Tokens and its types [keywords, identifiers, literals, punctuators, operators], primitive types and non-primitive types with examples, Introduce the primitive types with size in bits and bytes, Implicit type conversion and Explicit type conversion. Operators in Java Forms of operators, Types of operators, Counters, Accumulators, Hierarchy of operators, 'new' operator, dot (.) operator. Forms of operators (Unary, Binary, Ternary), types of operators (Arithmetic, Relational, Logical, Assignment, Increment, Decrement, Short hand operators), Discuss precedence and associativity of operators, prefix and postfix, Creation of dynamic memory by using new operator, invoking members of class using dot operator, Introduce System. out. printing () and System. out. print () for simple output.

**(I)** Input in Java Initialization, Parameter, introduction to packages, Input streams (Scanner Class), types of errors, types of comments Initialization – Data before execution, Parameters – at the time of execution, input stream – data entry during execution – using methods of Scannerclass [nextShort (), nextInt (), nextLong (), nextFloat (), nextDouble (), next (), nextLine (), charAt(0) ] Discuss different types of errors occurring during the execution and compilation of the program (syntax errors, runtime errors and logical errors).Single line comment (//) and multiline comment (/* … */ ) Mathematical Library Methods Introduction to package java. Lang [default], methods of Math class. pow (x, y), sqrt(x), cbrt(x), ceil(x), floor(x), round (x), abs(a), max (a, b), min (a, b), random (). Java expressions – using all the operators and methods of Math

class. Conditional structure in java Application of if, if else, if else if ladder, switch-case, default, break. if, if else, if else if, Nested if, switch case, break statement, fall through condition in switch case, Menu driven programs, System; Exit (0) - to terminate the program. Iterative constructs in Java: Definition, Types of looping statements, entry-controlled loops [ for, while], exit controlled loop [do while], variations in looping statements, and Jump statements.

**Class**

**IX(A)**

**Computer Systems** : Characteristics of a Computer, Components of a Computer System –CPU, Memory, Storage Devices and I/O Devices, Types of Software: System Software – Operating System, Device Drivers and Application Software

**DOS** : Commonly Used Commands – dir, cls, cd, copy con, md, rd, rename, copy, move, del,date, time

**Introduction to Word Processing** : Create and Save a Document, Text Editing – Undo and Redo, Copy and Paste, Selecting Text, Find and Replace, Apply Formatting Features – Alignment, Indentation, Line and/or Paragraph Spacing, Subscript and Superscript, Change Case, Highlighting, and Page Background, Bullets and Numbering, Border and Shading, DropCap, Views

**(B)**

**Computer Networking** : Type of Networks – PAN, LAN, MAN, WAN, Wired/WirelessCommunication, Wi-Fi, Bluetooth, Topology

**Cyber-Safety** : Safely Browsing the Web and Using Social Networks – Identity Protection, Proper Usage of Passwords, Privacy, Confidentiality of Information, Cyber Stalking, Malware

– Viruses, Worm, Trojan, Spyware, Adware etc

**More Features of Word Processing** : Header/Footer, Page Numbers, Columns, Symbols, Track Changes, Review Comments, Use of Drawing Tools, Shapes, Mathematical Symbols and Equation, Spell Check, Synonyms and Thesaurus, Page Setup, Insert Tables – Insert/Delete Rows and Columns, Merge and Split Cells.

**(C)**

**Presentation Tool** : Understand the Concept of Slide Shows, Basic Elements of a Slide, Different Types of Slide Layouts, Create and Save a Presentation, Different Views of a Slide – Normal View, Slide Sorter View, Notes Page View, Reading View, Slide Show View, Edit and Format a Slide – Add Titles, Subtitles, Text, Background, and Watermark, Headers and Footers, and Slide Numbers, Inserting an Image and Graphic Objects – Line, Shapes etc

**Number System** : Decimal, Binary, Octal, Hexadecimal and their Inter-Conversion

**Java** : Difference between Procedure Oriented and Object Oriented Programming, Four Principles of Object Oriented Programming – Data abstraction, Inheritance, Polymorphism,
Encapsulation

**(D)**

**More on Presentation Tool** : SmartArt, Audio and Video Files, Custom Animation, Transitions, Slide Show Slide Masters, Inserting Tables and Charts in Presentation, Hyperlinks

**Spreadsheets** : Concept of a Worksheet and a Workbook, Create and Save a Worksheet, Parts of a Spreadsheet, Rows and Columns, Cell and Cell Address, Range of Cells, Different Types of Data – Numbers, Text, Date/Time, Edit and Format a Worksheet including Changing the Colour, Size, Font, Alignment of Text, Conditional Formatting; Insert and Delete Cells, Rows and Columns, Concept of Referencing – Relative Referencing, Mixed Referencing, Absolute Referencing, Auto Fill

**Java** : Types of Java Programs – Applets and Applications, Java Compilation Process, Java Source code, Byte Code, Object Code, Java Virtual Machine (JVM), Features of Java,
Elementary Concept of Objects and Classes

**(E)**

**Formula and Functions in Spreadsheets** : Formulae with Cell Addresses and Operators, Commonly Used Basic Functions in a Spreadsheet – SUM, AVERAGE, MAX, MIN, COUNT, IF, AutoSum, Importance of Chart in Spreadsheet, Types of Chart

**Java** : Character Set, ASCII Code, Unicode, Escape Sequences, Tokens and Its Types – Keywords, Identifiers, Literals, Punctuators, Operators, Data Types – Primitive Types (with Size in Bits and Bytes) and Non-Primitive Types, Implicit Type Conversion and Explicit Type Conversion, Methods of Scanner Class – nextShort(), nextInt( ), nextLong( ), nextFloat ( ), nextDouble( ), next( ), nextLine( ), next( ).charAt(0), Different Types of Errors – Syntax Errors, Runtime Errors and Logical Errors, Comments

**(F)**

**Java** : Forms of Operators (Unary, Binary, Ternary), Types of Operators (Arithmetic, Relational, Logical, Assignment, Increment, Decrement, Short Hand Operators), Precedence and Associativity of Operators, Prefix and Postfix, Creation of Dynamic Memory by using new Operator, Invoking Members of Class using dot Operator

**Introduction to Python** : Character Set, Tokens, String Types – Single and Multiline, Literals, Operators, Comments, Multiple Assignments, input() and print()

**(G)**

**Java** : Introduction to Package, Methods of Math Class – pow(x,y), sqrt(x), cbrt(x), ceil(x),floor(x), round(x), abs(a), max(a, b), min(a,b), random( ).

**Python Fundamentals** : Data Types, Mutable and Immutable Types, Operators in details, Expressions

**(H)**

**Java** : Conditional Constructs – if, if else, if else if, Nested if, switch case, break statement, FallThrough Condition in switch case, System.exit(0)

**Python** : Flow of Control and Conditions

**(I)**

**Java** : Iterative Constructs – Entry and Exit Controlled Loops, Finite and Infinite Loops, Multiple Counter Variables (Initializations and Updations), Nested Loops, break and continue

**Python** : Lists

**Class X**

**(A)**

**Computer Networking** : World Wide Web, Web Servers, Web Clients, Web Sites, Web Pages, Web Browsers, Blogs, News Groups, HTML, Web Address, E-Mail Address, Downloading and Uploading Files from a Remote Site. Internet Protocols: TCP/IP, SMTP, POP3, HTTP, HTTPS. Remote Login and File Transfer Protocols: SSH, SFTP, FTP, SCP, TELNET, SMTP, TCP/IP. Web Services: Chat, Email, Video Conferencing, E-Learning, E-Banking, E-shopping, E-Reservation, E-Governance, E-Groups, Social Networking. MobileTechnologies: SMS, MMS, 3G, 4G.

**(B)**

**Advanced Features of Word Processing** : Create and Apply Styles in the Document, Themes, Insert and Use Images in Document, Text Wrapping, Links, Footnotes and Endnotes, Create and Use Template, Create and Customize Table of Contents, Implement Mail Merge

**Introduction to AI** : What is Artificial Intelligence and What is not, Related Terminologies – AI, ML and DL, AI Domains (Data, CV & NLP), AI Project Cycle, Rule Based & Learning Based AI Approaches, AI around Us

**(C)**

**Advanced Features of Electronic Spreadsheet** : Analyze Data using Scenarios and Goal Seek, Solver, Sort and Filter, Consolidate, Subtotal, Link Data and Spreadsheets, Share and Review a Spreadsheet, Create and Use Macros in Spreadsheet

**HTML** : HTML tags: html, head, title, body, (attributes: text, background, bgcolor, link, vlink, alink), br (break), hr(horizontal rule), inserting comments, h1..h6 (heading), p (paragraph), b (bold), i (italics), u (underline), ul (unordered list), ol (ordered list), and li (list item).
Description lists: dl, dt and dd. Attributes of ol (start, type), ul (type).

**(D)**

**HTML** : Font tag (attributes: face, size, color), Insert images – img (attributes: src, width, height, alt), sup (super script), sub (subscript), Links – significance of linking, anchor element (attributes: href, mailto), targets,

Embed audio and video in a HTML page.

**AI** : Neural Networks, Introduction to Natural Language Processing – Applications, Chatbots,Techniques

**Cyber Ethics** : Intellectual Property Rights, Plagiarism and Digital Property Rights, E-commerce: Privacy, Fraud, Secure Data Transmission

**(E)**

**HTML** : Create a Table using the tags – table, tr, th, td, rowspan, colspan, HTML Forms:Textbox, radio buttons, checkbox, password, list, combobox and their properties

**Database Management System** : Concept of Database Management System, Create and Edit Tables using Wizard and SQL commands, Perform operations on table, Insert, Update, Delete and Retrieve data using SQL query, Create Forms and Reports using Wizard

**(F)**

**Cascading Style Sheets** : colour, background-colour, border-style, margin, height, width,outline, font (family, style, size), align, float.

**Java** : Encapsulation – Access specifiers (private, protected and public), Visibility rules for private, protected and public access specifier, Scope of Variables (class variables, instance variables, argument variables, local variables), Concept of Array (Single and Double)

**(G)**

**Java** : User defined Methods – Ways to Invoke the Methods (Call by Value and Call by Reference), Actual Parameters and Formal Parameters, Declaration of Methods - Static and Non-static, Method Prototype / Signature, Pure and Impure Methods, Method Overloading, Returning Values from the Methods, Constructors – Default Constructor, Parameterized Constructor, Constructor Overloading, Difference between Constructor and Method.

**(H)**

**Java** : Introduction to Wrapper Classes, Methods of Wrapper Class and their Usage with Respect to Numeric and Character Data Types, Autoboxing and Unboxing in Wrapper Classes.
String class, All Methods of String class

**(I)**

**Data Science and Computer Vision** : What is Data Science and its Applications, Python for Data Science – Introduction to numpy, pandas and matplotlib, What is Computer Vision and itsApplications, Concept of Images and Pixels, Introduction to OpenCV

**Boolean Algebra** : Basic Gates (AND, OR, NOT), Universal Gates (NAND, NOR), XOR, XNOR gates, Implementation of Basic Gates from Universal Gates, Half Adder, Full Adder, Half Subtractor, Full Subtractor, Simplification of Algebraic Expressions, Dual and Complement

## Class XI

**(A)**

**Brief Review of Computer Hardware**: History of Computer, Computer Generations, Developments in Computer Technology, Block Diagram Of

Computer System, Input Devices, Output Devices, CPU, Primary & Secondary, MemorySystems, CD-ROM, Multimedia System.

**Concepts of Computer Software & Language**: Importance of Software, System Software Vs Application Software, Operating System Overview (Dos & Windows), Use of Utility Programs-Editor, Compiler, Interpreter, Programming Languages-Generation of Languages, Languages used for problem solving

Scientific, Commercial, Data Manipulation.

**(B)**

**Propositional logic, Hardware implementation, Arithmetic implementation:**

Propositional logic, Logic And hardware.

**Primitive values, Wrapper classes, Types and casting:** Primitive values and types.

**Variables and Expressions:** Variables as name for the value Assignment operation Difference between the left-hand side and right-hand of an assignment.

**Statements, Scope:** Statements Grouping statements**,**

**Methods Of Constructors:** Methods as Mechanisms for side effects. Formal arguments and actual arguments in methods.

**(C)**

**Arrays, String:** Structured data types. Examples of algorithms that use structured data typesTrends and Ethical issues.

**Basic Input / Output Data file handing (Binary and Text):** Basics input/output usingScanner and Printer. Data File Handing.

**Recursion**: Concepts and methods of recursion.

**(D)**

**Lists:** Introduction, Indexing, List operations (concatenation, repetition, membership andslicing), traversing a list using loops, built-in functions/methods-len(), list() append(), extend(), insert(), count(), index(), remove(), pop(),

reverse(), sort(), sorted(), min(), max(), sum(); nested lists,
suggested programs: finding the maximum, minimum, mean of numeric values stored in a list; linear search on list of numbers and counting the frequency of elements on a list.

**Python:** Tuple, dictionary.

**(E)**

**Utility Software:** Anti-Virus, file Management tools, Compression tools, Disk Managementtools - Disk cleanup, Disk Defragmenter Backup

**MS WORD**:- Text Basics, Text Formatting and saving file, Working with Objects, Header & Footers, Working with bullets and numbered lists, Tables, Styles and Content, Merging Documents, Sharing and Maintaining Document, Proofing the document, Printing.

**Open Source Concepts:** Open source Software, Freeware, Shareware, Proprietary software.

**Introduction to HTML:** HTML tags versus HTML ELEMENTS, History of HTML, How to design a first HTML page, HTML attributes, Tables, images, block & inline, classes, iframe.

**(F)**

**Packages**: Creation of packages, Interaction of objects across packages.

**Trends in computing and ethical issues:** Artificial intelligence, Virtual Reality AndAugmented Reality, Cyber Security.

**MS POWERPOINT :-**Creating slides and applying themes, Working with bullets and numbering, Working with Objects, Hyperlinks and Action Buttons, Working With Moviesand Sounds, Using SmartArt and Tables, Animation and Slide Transition, Using slide Master, Slide show option, Proofing and Printing

**Boolean Algebra Operations:-** Conjunction or And operation, Disjunction or operation, Negative or Not operation**.**

**(G)**

**Data Representation:** Review of number system-binary, Octal, Hexadecimal, Conversion of binary to decimal, Binary to Octal, Binary to Hexadecimal & Vice- Versa.

**What is computer Virus:** types of virus, Boot Sector Virus, Direct Action Virus, Resident Virus, Multipartite Virus, Overwrite Virus, Polymorphic Virus, Macro Virus, Different between Virus And Anti Virus.

**C:-**Introduction to c Programming, Fundamentals, and control structure.

**(H)**

**Introduction to Visual Basic**

**Getting familiar with VB interface:** Standard exe, pull-down menus, toolbar, toolbox, project, explorer, properties window, form layout window, form immediate window, opening and closing windows, resizing

and moving windows, quitting VB.

**VB Tool Box:** Standard window controls, label, textbox, command-button, frame, check-box, option-button, list-box, combo-box, picture box, timer control, shapes, Loop Structures

**(I)**

**JAVA:** Features of Java, Tokens, Character, Set, Keywords, Identifiers, Strings, Comments, Modifiers, Constructors, Polymorphism, Encapsulation, inner classes E scape Sequence, Relational Operators, Logical Operators, Assignment Operators, Unary Operators, Conditional.

**Class**

**XII(A)**

**Database Management:** Database Concepts: Introduction to database concepts and its need.

**Relational data model:** relation, attribute, tuple, domain, cardinality, keys. (candidate key,primary key, alternate key, foreign key)

**Structured Query Language:** Introduction, Data Definition Language and Data ManipulationLanguage, data type(char(n), varchar(n), int, float, data), constraints (not null, unique, primary key), create database, use database, show database, drop database, show tables, create table, describe table, alter table ( add and remove and attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in between, order by, meaning of null, is null, is not null, like, update command, delete command, aggregate functions (max, min, avg , sum, count), group by, having clause, joins: cartesian product on two tables, equi- join and naturaljoin.

**(B)**

**Database Management:** Create a student table and insert data, Implement the following SQLcommands on the student table:

ALTER table to add new attributes / modify data type / drop attribute

UPDATE table tomodify data

ORDER by display data in ascending / descending

order DELETE toremove tuple(s)

GROUP by find the min, max, sum, count and average

**COMPUTER NETWORKS:** Evolution of networking: Introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)

Data communication terminologies: concept of communication, components of data communication ( sender, receiver, message, communication, media, protocols), measuring capacity of communication media (bandwidth, data

transfer rate) ,IP address, switching techniques (Circuit switching, Packet switching)

**(C)**

**Transmission media:** Wired communication media (Twisted pair cable, CO-axial cable, Fiber- optic cable), Wireless media ( Radio waves, Micro waves, Infrared waves)

Network devices ( Modern, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway,WIFI card)

Network topologies and Network types :Types of network (PAN, LAN, MAN, WAN)networking topologies( Bus, Star, Tree)

Network protocol: HTTP, FFP, PPP, SMTP, TCP/ IP, POP3, HTTPS, TELNET, VoIP

Introduction to web services: WWW, Hyer Text Markup Language (HTML) Extensible Markup Language (XML), domain names, URL, website browser, web server, webhosting.

**Python database connectivity:-** Import the required packages, Establish a connection, ExecuteSQL command, Process as per the requirements, Pandas and Matplotlib of python.

**(D)**

**Objects:** Primitive Values, Wrapper Classes, Types and Casting, Primitive variable and types, appropriate, wrapper classes, user-defined type casting, and automatedtype coercion are all available**.**

**Introduction : What is object oriented programming:-** Why do we need objectoriented. Programming characteristics of object-oriented languages. C and C++.

**Variable, Expression and evaluation:** n constants, variables serve as names for values.

**Statements, Scope:** Looping, conditional( if, if else, else if, switch case) ternary operator, looping (for, while, do while) continue break; grouping statements, blocks of statements, variable of visibility.

**(E)**

Arrays, Strings Structured data types: arrays (single and multidimensional) string, Example algorithms that use Structured data types (searching, finding maximum / minimum, sorting techniques, solving systems of linear equations, substring, concatenation, length, access to char in string, etc)

**JavaScript: I**ntroduction of JavaScript, Syntax, Js example, js data types, Js Operators, Js function.

**(F)**

**Functions:** types of functions (built- in function, functions defined in module, user definedfunctions), creating user defined function, arguments and
parameters, default parameters, positional parameters, function returning values(s), flow ofexecution, scope of variable (global scope, local scope)

Exception Handing**:** Introduction, handing exception using try-except-finally blocks Introduction to files, types of files ( Text file, Binary file, CSV file), relative and absolute paths.**(G)**

**Text file:** opening a text file, text file open modes (r, r+, w, w+, a, a+, a+), closing a text file, opening a file using with clause, writing/ appending data to a text

file using write() and writelines(), reading from a text file using read(), readline() ,and readlines(), seek and tell methods, manipulation of data in text file.

**Binary file:** basic operations on a binary file: open using file open modes( rb+, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load(), method, read ,write/ create, search, append and update operations in a binary file.

**CSV file:** import csv module, open/ close csv file, write into a csv file using writer(), writerow(), writerows() and read from a csv file using reader()

**Data Structure:** Stack, operations on stack (push & pop), implementation of stack using list.

**(H)**

**Inheritance, Interfaces and Polymorphism:** Inheritance, super and derived classes; member access in derived classes; redefinition of variables and methods in subclasses;abstract classes; class Object; protected visibility.

Subclass polymorphism and dynamic binding.

Interfaces in Java, relationship between classes and interfaces.

**(I)**

**Microsoft Access:-** Create Database, Create Blank Database, Data Type.

**Computer Hardware:** Elementary logic gates ( NOT, AND, NAND, XOR, XNOR) and theiruse in circuits.

**Application of Boolean algebra:** logic gates to half adders, full adders, encoders, decoders,multiplexers, NAND, NOR as universal gates**.**