B.Voc (Software Development) 1st Semester

General Components

Paper Code- GBVOC-V-101

Communicative English Credit – 3 Full Marks – 50

Communication: Definition of communication, verbal and non verbal communication, types of communication, interpersonal and intrapersonal communication.

What is effective communication?, model of communication, verbal and non-verbal modes of communication, communication barriers, spoken and written communication, effective communication, role and function.

The four language skills: listening, speaking, reading, and writing.

Paper Code- GBVOC-V-105

Physics Credit – 3 Full Marks – 50

Classical mechanics and gravitation

Dimensions of physical quantities: Principle of dimensional homogeneity.

Vectors: axial and polar vectors, dot product and cross product, scalar triple product and vector triple product. Scalar and vector fields – gradient, divergence and curl.

Mechanics of a particles: Newton's laws of motion , principle of conservation of linear momentum, path integral of force, conservative force field, concept of potential, conservation of total energy.

Gravitation: gravitational potential and intensity due to thin uniform spherical shell and solid sphere of uniform density, escape velocity.

Waves and oscillations

Simple harmonic motion: differential equation and its solution.

Differential equation of wave motion : plane progressive wave- energy, and intensity. Bel, decibel and phon. Superposition of waves. Beats, velocity of longitudinal wave in slid and gas, velocity of transverse wave in string.

Paper Code- GBVOC-V-106

Electronics Credit – 3 Full Marks – 50

Introduction to Electric circuits, Physics of Semiconductor and Basic Electronics:

I. Introduction to Electric Circuits and Physics of semiconductor
Electric Circuit Elements: Resistance and resistors, types of resistors, resistor colour coding, variable resistors(pots and resistance boxes), power rating of resistors, capacitance and capacitors, types of capacitors,
voltage rating of capacitors, capacitor coding, self-inductance and inductor coils, air-core and iron-core coils,
mutual-inductance and transformers, autotransformer, transformer ratings, variable inductance.

Kirchoff's Laws and Network Theorems: Kirchoff's current and voltage laws, branch-current, mesh-current and
node voltage methods of circuit analysis, T to Pi and Pi to T conversions, Maximum Power Transfer.

Forced oscillations and resonance: Theory of forced oscillations in a series LCR circuit, series resonance in an
acceptor circuit, Q factor, parallel resonance in a rejector circuit.

Physics of Semiconductors: Classification of crystals into insulators, metals and semiconductors using energy
band theory, intrinsic and extrinsic semiconductors, p and n type semiconductors, mechanism of current
conduction in semiconductors (drift and diffusion), mobility, current density and conductivity.

Paper Code- GBVOC-V-107

Mathematics Credit – 3 Full Marks – 50

Mensuration. Permutation and combination, Probability, Binomial Theorem. Theory of equations upto 3rd
degree.

Complex Numbers:Basic concepts and applications.DeMoivre's Theorem and its applications.

Polynomials:FundamentalTheorem of Classical Algebra (Statement only).
Polynomials with real co-efficients: The nth degree polynomial equation has exactlynroots. Nature of roots of an equation (Surd or Complex roots occur in pairs). Statement of Descarte's Rule of signs and its applications.
Statements of :
(i) If the polynomial f(x) has opposite signs for two real values of x, e.g. a and b, the equation f(x) = 0 has an odd number of real roots between a and b; if f(a) and f(b) are of same sign, either no real root or an even number of roots lies between a and b.

Integral Calculus Integration of the form :
Derivative of first and second order

Skilled Components

Paper Code- SBVOC-SWD-V-101

Digital System Design and Computer Architecture Credit – 5 Full Marks – 80

Digital components
Overview of Computer Organisation logic gates adder flip flop as one bit memory. Decoders multiplexers register shift register counter Ram

Data representation
hexadecimal numbers ASCII code two component addition subtraction overflow floating point representation

Register transfer and microoperations
Bus and memory transfers three State Bus buffer binary adder binary Arithmetic circuit logic and shift micro operations ALU basic Computer Organisation, Direct and indirect address timing and control signal generation.Memory reference instructions input output instruction. Central Processing Unit organisation memory stack one address and two address

Arithmetic
Register and shift instruction software and Instruction pipelines, Arithmetic. – Addition And subtraction with signed magnitude data manipulation algorithms. Algorithm division algorithm input output organisation data transfer handshaking as synchronous serial transfer interrupt interface, DMA transfer interfacing peripherals with CPU introduction keyboard. Scanner Network ka introduction to pipelining and linear pipeline. .

Organisation
Rom ram hard disk cache memory direct mapping virtual memory. cache memory working principles.

Programming assembly language of Intel 8086 simple character operations.

Paper Code- SBVOC-SWD-V-102

Introduction to Application Packages (MS-OFFICE) Credit – 4 Full Marks – 70

❖ **Word**

- Page Layout Tab – Orientation, Margins, Size
- Fonts Group
- Edit - Drag/Drop, Copy Paste, Delete
- Spell Fix
- Grammar
- Paragraph Group – Align, Spacing, Indent Show/Hide
- View Tab - Page Layout, Ruler, Zoom
- File Tab - Save/Save as Print
- Find / replace
- Quick Access Toolbar
- Format Painter
- Save to .pdf
- Page Break
- Sections Breaks
- Table of Contents - Headings
- Header, Footer, Page numbers
- Columns
- Insert Hyperlink
- Insert Basic Table – Format, Edit
- Insert screen shot – Format, Edit
- Wrap text
- Bullets
- Numbering
- Mail Merge
- Track changes
- Adding Comments
- Forms and Templates - Table Forms, Developer Forms
- Restrict Editing
- Macros and repetitive actions

▪ **Power Point**

- Common functions
- Insert slide
- Insert Task Box
- Find / replace
- Quick Access Toolbar
- Format Painter
- Save to .pdf
- Design – Themes, Background
- Insert – Picture, ClipArt, Shapes, Smart Art, Format
- Header
- Footer
- Slide number
- View - Normal Slide, Slide Sort
- Slide Show – Animation, Transition
- Insert Comments
- Create Master Slide - Create Master Layouts, Understanding placeholders

- Create custom Template - Apply a template

- **Excel**
  - Page Layout – Orientation, Margins & Size
  - Fonts Group
  - Edit - Drag/Drop, Copy Paste, Delete
  - Spell Check, Alignment Group Cells, Rows, Columns
  - View Tab – Normal & Zoom,
  - Column Format – Width, Height, Cell Entry line
  - Sheets - Name sheets, Reorder Sheets
  - Simple Sort
  - Auto Sum Column and Row Print
  - Financials and formulas.
  - Find/Replace
  - Quick Access Toolbar
  - Format Painter
  - Wrap Text Merge Cells Format Cells -Numbers Alignment Font Border
  - Fill Protection
  - Header/ Footer
  - Print Options - Set Print Area, Repeat Top Rows, Print Page Break
  - Freeze rows and columns Comments
  - Remove Duplicates Advanced Sort Filter
  - The Excel environment Navigating a worksheet Spreadsheet terminology Gettinghelp
  - Entering and editing data Entering and editing text and values Entering and editing formulas Saving and updating workbooks.
  - Modifying a worksheet, Moving and copying data Moving and copying formulas, Inserting and deleting ranges, rows, and columns, Cell comments
  - Using functions Entering functions AutoSum Other common functions
  - Formatting Text formatting
  - Row and column formatting, Number formatting, Conditional formatting, Additional formatting options
  - Printing Preparing to print Page Setup options Printing worksheets
  - Charts Chart basics
  - Pie Chart
  - Bar Chart
  - Case Study Modifying existing worksheet Use shortcut keys
  - Create and email worksheet
  - Subtotal Functions
  - Create an outline and consolidate data Create subtotals in a list
  - Use multiple subtotal functions – SUBTOTAL, SUMIF
  - Create custom views to save different sets of worksheet display and print settings.
  - Range names and Filter date Define and apply cell and range names Use names in Formulas
  - Filter data based on complex criteria Use conditional filters
  - Copy filtered results to another range
  - Pivot Tables
  - Prepare data in a table format and name the table
  - Create a PivotTable for analyzing
  - Use the Download Actual page in Account Reconciliation as example
  - Modify or re-arrange fields

- Selected Functions Using IF and SUMIF functions to calculate a value based on specified criteria
- Use ROUND functions to round off numbers Use VLOOKUP to find values in worksheet data Use HLOOKUP to find values in worksheetdata.
- Import/Export Data
- Export data from Excel to other formats Import data from a text file into an Excel workbook.

Paper Code- SBVOC-SWD-V-103

Introduction to C Programming Credit – 5 Full Marks – 80

- **Introduction to Programming**

  How to develop a program, Algorithms, Flow-charts, Types of Programming Languages, Compiler and Linker, Testing and Debugging a program, Documentation.

- **Constants, Variables & Data Types**

  Character set, C Tokens, Identifiers and Keywords, Constants, Variables, Data types, Declaration of variables, declaration of storage class, assigning values to variables, defining symbolic constants, declaring a variable as constant, declaring a variable as volatile, overflow and underflow of data.

- **Operators & Expressions**

  Arithmetic operators, Relational, Logical operators, Assignment, increment and decrement operators, conditional operators, bitwise operators, special operators, arithmetic expressions, evaluation of arithmetic expressions, precedence of arithmetic expressions, some computational problems, type conversion in expressions, operator precedence and associatively, mathematical functions.

- **Managing Input & output operations**

  Reading a character, writing a character, formatted input, and formatted output.

- **Decision Making – Branching & Looping**

  Decision making with IF statement, switch statement ? : operator, goto statement. While statement, do-while statement, for statement, Jumps in loops

- **Arrays**

  One dimensional array: Array Manipulation, Different operations on one dimensional arrays, two dimensional array, operations on two dimensional arrays, multi-dimensional array, dynamic arrays.

- **Handling of Character Strings**

  Declaring and initializing string variables, reading string from terminal, writing string to screen, putting strings together, comparison of two strings, string handling functions, table of strings.

- **Functions**

  Top down approach of problem solving, standard library functions, passing values between functions, scope rules of functions, calling convention, return type of functions, call by value and call by reference, recursive functions.

- **Storage Classes**

  Scope and extent, Storage Classes in a single source file: auto, extern and static, register.

- **Structures and Unions**

  Defining a structure, Declaring Structure variables, accessing structure members, structure initialization, copying and comparing structure variables, operation on individual members, arrays of structures, arrays within structures, structures and functions, union, size of structure, bit fields.

- **Pointers**

  Understanding pointers, accessing the address of a variable, declaring pointer variables, initialisation of pointer variables, accessing a variable through its pointer, chain of pointers, pointer expression, pointer increment and scale factor, pointer and arrays, pointers and character strings, array of pointers, pointers as function arguments, functions returning pointers, pointers to functions, pointers andstructures.

- **Dynamic Memory Allocation andLinkList**

  Dynamic Memory Allocation, Allocation a Block of memory: malloc, allocating multiple blcoks of memory: calloc, releasing the used space: free, Altering the size of a block: realloc. Concept of Link list, advantages of link lists, types of link list, pointers revisited, creating a linked list, inserting an item, deleting an item, application of linked lists.

- **FileProcessing**

  Defining and Opening a file, closing a file, input/output operations on files, error handling during I/O operations, random access to files, Command Line Arguments.

Paper Code- SBVOC-SWD-V-104

Introduction to Algorithms Credit – 4 Full Marks – 70

Elementary Algorithms: Notation for Expressing Algorithms; Role and Notation for Comments; Example of an Algorithm; Problems and Instances; Characteristics of an Algorithm; Building Blocks of Algorithms; Procedure and Recursion – Procedure, Recursion; Outline of Algorithms; Specification Methods for Algorithms.

Mathematical Functions and Notations Functions and Notations; Modular Arithmetic / Mod Function; Mathematical Expectation in Average Case Analysis; Efficiency of an Algorithm; Well Known Asymptotic Functions and Notations; Analysis of Algorithms .

Divide and Conquer Divide and Conquer Strategy.

Greedy Method Greedy Method Strategy.

Dynamic Programming Dynamic Programming Strategy.

Backtracking Strategy.

B.Voc (Software Development) 2nd Semester

General Components

Paper Code- GBVOC-V-201

Communicative English Credit – 3 Full Marks – 50

Remedial English Grammar : (with emphasis on functions and structures) : the article, linking verbs, negative sentences, questions, agreement or concord, verbs transitive and intransitive, regular and irregular, tense and their uses, verbs and adverbs, question tags, confusion of adjective and adverb, adverbials, use of no, not and none, difficulties with comparative and superlative, confusion of participles, active and passive voice, prepositions, negative verbs, redundant pronouns and prepositions, the use of correlative, use of who and whom, much and many, still and yet, so that, so as, make and do, errors in the use of individual words.

Paper Code- GBVOC-V-205

Physics Credit – 3 Full Marks – 50

General properties of Matter

Elasticity: Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear, modulus of rigidity, poisson's ratio.

Viscosity: streamline and turbulent flow. Critical velocity, Reynold's number, Bernoulli's theorem and its applications.

Surface tension: Surface energy and surface tension, angle of contact, capillary rise.

Geometrical Optics

Reflection and refraction : Fermat's Principle, laws of reflection and refraction at a plane surface, refraction at a spherical surface, lens formula. Combination of thin lenses - equivalent focal length.

Optical instrument: Dispersion and dispersive power, chromatic aberration, different types of seidel aberration. Ramsden and Huygens eye-piece.

Dynamics of rigid body: Moment of inertia and radius of gyration - their physical significance, theorems of parallel and perpendicular axes, rotational kinetic energy, calculation of moment of inertia for some simple symmetric systems. Physical significance of MI.

Paper Code- GBVOC-V-206

Electronics Credit – 3 Full Marks – 50

Basic Electronic Devices:p-n junction and the semiconductor diode: the p- n diode, Volt-ampere (V-I) characteristic of a forward and reverse biased p-n junction diode, difference in characteristics among Si, Ge and GaAs diodes, Shockley's equation,V-I characteristics of a reverse biased Zener diode.

Diode circuits: Diode as a circuit element, half and full-wave rectifier, PIV rating, Bridge rectifier, Effect of filters, load and line regulation with a zener diode.

Bipolar Junction Transistor(BJT):pnp and npn transistors in Common Base (CB) , Common Emitter (CE) andCommon Collector (CC) modes, current components in a BJT, current gains, input, output characteristics in CB and CE modes.

Field Effect Transistor (FET):Construction of a Junction Field Effect Transistor (JFET), n-channel and p-channel JFETs, drain characteristics of an n-channel JFET,construction of a Metal Oxide Semiconductor Field Effect Transistor (MOSFET), n-channel and p-channel, depletion and enhancement type MOSFETs, drain of n channel depletion MOSFET, FET parameters. Application of FET and MOSFET

Paper Code- GBVOC-V-207

Mathematics Credit – 3 Full Marks – 50

Polynomials:(ii) Rolle's Theorem and its direct applications. Relation between roots and co-efficients. Symmetric functions of roots, Transformations of equations.

Differential Calculus :Derivative – its geometrical and physical interpretation. Sign of derivative – Monotonic increasing and decreasing functions. Relation between continuity and derivability. Differential – application in finding approximation

Integral Calculus : Integration of rational functions. Evaluation of definite integrals.Integration as the limit of a sum (with equally spaced as well as unequal intervals).

Skilled Components

Paper Code- SBVOC-SWD-V 201

Data Structures Credit – 5 Full Marks – 80

A) Analysis of Algorithm

Introduction to Algorithm design and data structure: Design and analysis of algorithm, Algorithm definition, comparison of algorithms, Top-down and bottom-up approaches to algorithm design, Analysis of algorithm, Frequency count, Complexity measures in terms of time and space, Structured approach to programming.

B)Basic of C,Elementary data structure:Arrays and linked list

Basics of C, Structure of a Program Variables, Data types, Constants Operators, Basic Input/Output, Control Structure, Functions, Compound Data Types, Arrays, Pointers, Dynamic Memory, Object Oriented Programming, Classes, Encapsulation, Abstraction, Inheritance, Polymorphism. **Representation of arrays:** Single and multidimensional arrays, Address calculation using column and row major ordering, Various operations on Array, Vector. **Application of arrays:** Matrix multiplication, Sparse Polynomial representation and addition. **Stack and Queues:** Representation of stack and queues using array and linked list, Circular queues, Priority Queue and D-queue. **Application of stack:** Conversation from infix to postfix and prefix expression. Evaluation of postfix expression using stacks. **Pointer:** Definition, Pointer Arithmetic ,Array of pointers, Linked list:Singly linked list,Oprations on list,Linked stack and queues, Polynomial representation and manipulation using linked list, Circular linked lists and Doubly linked lists, Generalized list structure, Sparse matrix representation using generalized list structure, stacks and queues.

C) Abstract Data types Stacks and Queues

Definition of ADT, Stack ADT (array implementation), FIFO queue ADT (array implementation)

D) Trees

Binary tree traversal method: Pre-order, ln-order, Post-ordered traversal, Recursive Algorithm for above mentioned Traversal methods. **Representation of trees and its applications:** Binary tree representation of a general tree, Conversion of forest into tree, Threaded binary trees. **Binary search tree:** Height balanced (AVL) tree, B-trees

E) Searching, Sorting and Complexity

Selection sort, lnsertion sort, Bubble sort, quick sort, merge sort.Heap sort, Radix sort and their complexity. Searching: Sequential search, Binary search, Binary search tree,ASVLtrees,B trees Searching, sorting and complexity. **Searching :** Sequential and binary searchs, Indexed search, Hashing Schemes. Sorting: Insertion, selection ,bubble,Quick,Merge,Radix, Shell, Heap sort comparison of timecomplexity.

F)Graphs

Graph rersentation,Adjacencymatrix,Adjacencyliss.**Traversal schemes:** Depth first search,Breadth first search.**Spanning tree:** Defination, Minimal Spanning tree algorithm,shortst Path algorithm(Prime s and Kruskal's)

Paper Code- SBVOC-SWD-V 202

System Design, Trouble shooting and Operating System Credit – 4 Full Marks – 70

Process:

Concept and views OS view of processes, OS services for process management, scheduling algorithms. **Performance evaluation**: lnter-process communication and Synchronisation, mutual exclusion, semaphores, hardware support for mutual exclusion, queueing implementation of semaphores. Classical problem of concurrent programming, critical region and conditional critical region, monitors, messages, deadlocks. Resource manager,Memory management, file management processor management, device management.

Security and protection authentication, protection and access control, formal models of protection worms and viruses.

Multiprocessor system, classification and types OS functions and requirements, Introduction to parallel computing, multiprocessor interconnection synchronisation.

Distributes OS- rationales, algorithm for distributed processing.

Paper Code- SBVOC-SWD-V 203

Basic Web Design Credit – 5 Full Marks – 80

Basic web design (HTML CSS JavaScript)
Web Programming Introduction
Basic introduction to web development
HTML Introduction
History of HTML,Make your first HTML page, HTML tags and attributes, HTML tag and element
HTML- Basic formatting tags
HTML Basic tags, HTML Formatting Tags, HTML color coding
HTML-Grouping using Div Span
Div and span tag, block and inline
HTML lists
Unordered Lists, Ordered lists, Definition list
HTML-Images
About images
HTML-Hyperlink
About hyperlink
Module 8: HTML Table
About tables
<table>, <TH>,<TR>, <TD>, <caption>,<THEAD>, <TBODY>, <TBODY>, <TFOOT>, <colgroup>, <col>
HTML-iframe
About iframe, Attributes using iframe as the target
HTML-Form
About forms
<input>, <textarea>, <button>, <select>, <label>
HTML-headers
About HTML headers, title, base ,link, style, script, meta
HTML-miscellaneous
About miscellaneous tags
HTML meta tag, XHTML, HTML deprecated tags and attributes

CSS2-introduction
CSS and benefits of using CSS, Benefits of CSS, CSS versions history, CSS syntax, external style sheet using <link>, multiple style sheets, value length and percentage CSS2-Syntax
About CSS syntax
CSS-Selectors
About selectors, ID selectors, class selectors, grouping selectors, Universal selectors, Descendant / child selectors, attribute selectors, CSS-pseudoclasses
CSS2-color background cursor
About background-color and cursor, background color, background image, background repeat, background position, CSS cursor.
CSS-text fonts
About text fonts, color, background-color, text decoration, text-align, vertical align, text indent, text transform, white-space, letter spacing,word spacing, line height, font family, font size, font-style, font-variant, font-weight
CSS2 list tables
About list tables
CSS table border, width and height, text-align, vertical-align padding color
CSS2-box model
Borders and outline, margin and padding, height and width, CSS dimension
CSS2-display positioning
About display Positioning
CSS visibility, CSS display, CSS scrollbars, CSS Positioning
Static Positioning, fixed positioning, relative Positioning, absolute Positioning, CSS layer with z-index
CSS floats
About floats
The float property, the clear property, the clear fix hack
The nature of JavaScript
Evolution of scripting languages, JavaScript-definition, comparison between Java JavaScript and VB script
Jump starting JavaScript
Introduction to objects, methods and events, events and program flow, jumping right In Running script
Script writing basics
Launching HTML documents with JavaScript, The Quintessntial building blocks, script mechanics
Using names,objects and methods
Names and references in JavaScript, Built-in-objects, Home-Built objects, The hierarchy of names, Using methods, Operators and variables, keywords functions, Object interaction

Paper Code- SBVOC-SWD-V 204

Software Engineering Credit – 4 Full Marks – 70

1. Software Engineering Fundamentals

Definition of software product and process, Software Characteristics, Components, Applications, Layered Technologies, Processes and Product, Methods and Tools, Generic View of Software Engineering, Software Crisis, Software development paradigms, Techniques of Process Modeling, Software Process and lifecycle models: Build & Fix Model, Waterfall Model, Prototyping Model, Iterative Enhancement Model, Evolutionary Development Model and Spiral Model, Incremental, and Concurrent Development Model.

2. Software Requirements Analysis & Specification

System specification, Software requirements specification (SRS) standards, Formal specification methods, Specification tools, Requirements validation and management. Problem Recognition, Evaluation and Synthesis, Modeling, Specifications and Review Techniques. Analysis Modeling: Difference between Data and Information, ER Diagram, Dataflow Model, Control Flow Model, Control and Process Specification, Data Dictionary.

3. Software Design

Software architecture, Modular design - cohesion and coupling, Process-oriented design, Process and Optimization, Data-oriented design, User-interface design, Real-time software design, Architectural Designing, Interface Design, Procedural Design, Object Oriented Design.

4. CASE Tools

Computer-aided software engineering, Introduction to CASE, Building Blocks of CASE, Relevance of CASE tools, High-end and low-end CASE tools, automated support for data dictionaries, DFD, ER diagrams, Integrated Case Environment, CASE workbenches.

5. Coding and Testing

Choice of Programming languages, Coding standards, Introduction to Testing Process, Functional & Structural Testing, Testing Activities like Unit, Integration & System Testing, Testing tools and workbenches.

6. User Interface Design

Concepts of Ui, Interface Design Model, Internal and External Design, Evaluation, Interaction and Information Display.

7. Configuration Management

Concepts in Configuration Management, The Configuration Management Process: Planning and Setting up Configuration Management, Perform Configuration Control, Status Monitoring and Audits.

8. Software Maintenance

What is software maintenance, Maintenance Process & Models, Reverse Engineering, Software re-engineering, Configuration Management issues and concept, Configuration planning & techniques, Software versions and change control process, Documentation.

9. Software Quality and Metrics

SQA-Software Quality Assurance, Debugging and reliability analysis, Program complexity analysis, Software quality and metrics, Quality Control, Approaches to SQA, Reliability, ISO9000 and 9001, CMM Levels and SIX sigma.

10. Object-Oriented Software Engineering

OO Concepts and Approach, OO Analysis, Domain Analysis, OOA Process and Object Models, OO Design, System Design process and Models, UML and diagrams

11. Advance Software Engineering Topics

Clean room approach and strategy, Functional specification and design, Component-based software engineering process, Reusability and Metrics, Reengineering Essentials, Software Agents.

B.Voc (Software Development) 3rd Semester

General Components

Paper Code- GBVOC-VI-301

Communicative English Credit – 3 Full Marks – 50

Listening : What is active listening? Listening and hearing, listening and hearing, listening and giving feedback, listening comprehension.

Speaking : The phonemes of English, syllable, stress and intonation, pronunciation practice, accuracy focused and fluency focused activities.

Personality building : Appropriate use of register, style, lexis and body language, concept of soft skill, confidence and personality building.

Paper Code- GBVOC-VI-305

Physics Credit – 3 Full Marks – 50

Heat
Kinetic Theory of Gases : Perfect gas, pressure exerted by it(no derivation required), Maxwell's law of distribution of molecular velocities (statement only) - rms, mean and most probable velocities, degrees of freedom, principle of equipartition of energy - application in simple cases. Van der Waals equation (qualitative study), critical constants.
Thermal Conductivity : Steady state and variable state, thermal and thermometric conductivity, Ingen Hausz's experiment.
Physical Optics
Light as an electromagnetic wave : Full electromagnetic spectrum, properties of electromagnetic waves, Huygens' principle — explanation of the laws of reflection and refraction.
Interference of light : Young's experiment, intensity distribution, conditions of interference, Newton's ring.
Diffraction : Fresnel and Fraunhofer class, Fresnel's half-period zones, zone plate. resolving power.
Current Electricity
Steady Current : Network analysis — Kirchoff's laws, Thevnin and Norton's theorem, Wheatstone bridge, potentiometer.

Paper Code- GBVOC-VI-306

Electronics Credit – 3 Full Marks – 50

Analog Electronic Circuits

Transistor biasing: Operating point and the need for biasing, Fixed bias and self-bias.

Transistor amplifier: CE amplifier, R-C coupled amplifier

Operational Amplifier (Op-Amp)and Op-Amp circuits

The 741 Op-Amp: Ideal and practical characteristics of the 741 Op-amp: open loop voltage gain, unity-gain
frequency, input resistance, output resistance, input bias current, input offset current, input offset voltage,
common-mode rejection ratio .

Op-amp circuits: Inverting amplifier, concept of virtual ground, adder, non-inverting amplifier, concept of virtual short, unity gain buffer, phase-shifter, differential amplifier, differentiator, integrator, first order low pass and high pass active filter, comparator, Schmitt-trigger.
Feedback and Oscillators: Concept, negative Feedback, Advantages of negative feedback, Barkhaussen
criteria Wien Bridge oscillator.
Power Amplifier: Class A, B, AB amplifier, transformer coupled.

Paper Code- GBVOC-VI-307

Mathematics Credit – 3 Full Marks – 50

Differential Equations:Order, degree and solution of an ordinary differential equation (ODE) in presence of arbitrary constants. Formation of ODE.
First order equations:
(i) Variables separable.
(ii) Homogeneous equations and equations reducible to homogeneous forms.
(iii) Exact equations and those reducible to such equation.
(iv) Euler's and Bernoulli's equations (Linear).
(v) Clairaut'sEquations : General and Singular solutions.

Skilled Components

Paper Code- SBVOC-SWD-VI-301

DATABASE MANAGEMENT SYSTEM (DBMS) Credit – 5Full Marks – 80

1. An Overview of the Database Management System
What is database? Why database? Database system, database management system (DBMS), advantages of DBMS.
2. An Architecture of the Database system
Three levels of architecture, mappings, role of database administrator(DBA), E-R model, three approaches of DBMS- relational, hierarchical and network.
3. Relational Database Management System (RDBMS)
Introduction, RDBMS terminology, relational model, base tables, keys.
4. Normalization
Normal forms, Boyce-Codd Normal form, higher normal forms.
5. Relational Algebra and Relational Calculus
Relational operators, tuple calculus, well formed formulae.
6. The SQL Language
Introduction , Characteristics of SQL, data definition, data manipulation, SQL commands, SQL operators, Queries, aggregate functions.
7. Backup and Recovery
Transaction recovery, system recovery, SQL support
8. Security
General considerations, controls, audit trail, data encryption, SQL support.
9. Integrity
General considerations, integrity rules, SQL support.
10. Design and Development of Database Applications
Database applications using some standard RDBMS.

Paper Code- SBVOC-SWD-VI-302

OBJECT ORIENTED PROGRAMMING WITH C++ Credit – 5 Full Marks – 80

Basic of Object Oriented Programming and software design
C++ Object Oriented Programming.
C++ & ANSI standard C Predefined classes in C++.
Building objects with classes.
Introduction to Constructor &Destructor .
Defining operations on objects.
Using Inheritance in C++.
Concepts of Overloading.
Virtual functions and Polymorphism.
Using C libraries in C++ programs using commercial Class libraries (Standard template library).
Advanced Topics in C++ (Template Exception Handling file handling Stream).

Paper Code- SBVOC-SWD-VI-303

DATA COMMUNICATION AND COMPUTER NETWORKING (DCN)

Credit – 4 Full Marks – 70

UNIT 1:

Data Communications
Introduction, Communication Systems, Signal and data, Transmission modes, Synchronous and asynchronous transmission, Circuits, channels and multichanneling, Signaling, Encoding and decoding, Error detection and Recovery, Flow control, Sliding Window, Congestion Management, Multiplexing [FDM, TDM, CDM, WDM] and Spreading [DS. FH], Concept of Modulation, Baseband versus Broadband; Pulse Code Modulation (PCM), Shift Keying [ASK, FSK, PSK, QPSK, DPSK]; Encoding techniques and CODEC; Classification of Modems, Standards and Protocols, Protocols used by Modem to Transfer files, Establishing a Connection (Internet connectivity); Digital Subscriber Loop (DSL)
UNIT 2:

Communication Network Fundamentals
Introduction, Switching techniques: Circuit Switching, Packet switching, Datagram, Virtual circuit and Permanent Virtual Circuit, Connectionless and connection oriented communication, Message switching, Cell switching (ATM); Telephone network signaling Network topologies, Layering the communication process, Open Systems Interconnection (OSI) model, Data encapsulation; Protocols, services and layering, PDU/SDU; TCP/IP suite, Hour-glass model, Internet Architecture and Protocol overview.
UNIT 3:

Media Access Control
Introduction, Access Techniques (STDM, FDMA, TDMA, Spread Spectrum techniques and CDMA, DSSS, FHSS); Media Access Control: Aloha and Slotted Aloha, Media Access Control Address, Polling, CSMA, CSMA/CA, CSMA/CD and Reservation Aloha, Digital hierarchies [SONET/SDH]
UNIT 4:

Network Components
Introduction, LAN Hardware, LAN Operating Systems, Transmission Media: Guided Media (Twisted pair, Co-axial cable, Optical fiber); Unguided Media (Radio, VHF, microwave, satellite, Infrared);

Fiber Optics Communication Components (Source, Channel Detector.

UNIT 5:

Link Control and MAC Protocols

Framing, Error Detection and Correction; Window-based Flow Control; Logical Link Control, HDLC Protocol, Point-to-Point Protocol (PPP), X.25 CCITT standard for packet data transmission; Media access control, Random Access Techniques, Scheduling Mechanisms.

UNIT 6:

Local Area Network (LAN)

LAN topologies and protocols; IEEE 802 Standard; Ethernet (Standard, Fast, Gigabit), Token Ring, FDDI, Wireless LANs (802.11x); Connecting LANs: Repeaters, Bridges, Switches, Routers; Virtual LANs

UNIT 7:

Wide Area Network (WAN)

Network Layer Addressing and Routing concepts (Forwarding Function, Filtering Function); Routing Methods (Static and dynamic routing, Distributed routing, Hierarchical Routing); Distance Vector Protocol, Link State protocol, Open Shortest Path First (OSPF); Internet Protocol (IP): Addressing & Routing; Internet Control Message Protocol, (ICMP), Address Resolution Protocol (ARP), Dynamic Host Control Protocol (DHCP), Network Address Translation (NAT), IPv6, Mobile IP Process-to-Process delivery in Transport Layer: User Datagram Protocol (UDP), Transmission Control Protocol (TCP), congestion control

UNIT 8:

Application Protocols

Client/Server Model, Network File System (NFS), Remote Login: Telnet; File Transfer Protocol (FTP), Trivial File Transfer Protocol (TFTP); E-mail system: Simple Mail Transfer Protocol (SMTP), Post Office Protocol (POP); World Wide Web (WWW), Domain Name System (DNS), DNS servers; Hyper Text system: Hyper Text Transfer Protocol (HTTP), Hyper Text markup Language (HTML)

UNIT 9

Wireless Networks

Radio Communications, Cellular Radio, Mobile Telephony (GSM & CDMA), Satellite Networks (VSAT), Mobile Adhoc Networks (MANET).

UNIT 10:

Security and Management

Cryptography, IPsec, SSL/TLS, PGP, secure HTTP, proxy, firewall, VPN; Simple Network Management Protocol (SNMP), Network policies.

Paper Code- SBVOC-SWD-VI-304

COMPUTER GRAPHICS Credit – 4 Full Marks – 70

UNIT 1:

- **Introduction to Computer Graphics**

Overview of Computer Graphics, Computer Graphics Application and Software, Description of some graphics devices, Input Devices for Operator Interaction, Active and Passive Graphics Devices, Display Technologies, Storage Tube Graphics Displays, Calligraphic Refresh Graphics Displays, Raster Refresh (Raster-Scan) Graphics Displays, Cathode Ray Tube Basics, Color CRT Raster Scan Basics, Video Basics, The Video Controller, Random Scan Display Processor, LCD displays.

UNIT 2:

- **Two-Dimensional Transformations**

Transformations and Matrices, Transformation Conventions, 2D Transformations, Homogeneous Coordinates and Matrix Representation of 2D Transformations, Translations and Homogeneous Coordinates, Rotation, Reflection, Scaling.

UNIT 3:

- **Three-Dimensional Transformations**

Introduction, Three-Dimensional Scaling, Three-Dimensional Shearing, Three-Dimensional Rotation, Three-Dimensional Reflection, Three-Dimensional Translation, Multiple Transformation, Rotation about an Arbitrary Axis in Space, Reflection through an Arbitrary Plane, Matrix Representation of 3D Transformations, Composition of 3D Transformations

UNIT 4:

- **Scan conversion – lines, circles and Ellipses; Filling polygons and clipping algorithms**

Scan Converting Lines, Mid-point criteria, Problems of Aliasing, end-point ordering and clipping lines, Scan Converting Circles, Scan Converting Ellipses, Filling Polygons, edge data structure, Clipping Lines algorithms– Cyrus-Beck, Cohen-Sutherland.

UNIT 5:

- **ADOBE PhotoShop**
  - **Overview of the Photoshop**
    - What is Photoshop
  - **Interface & operations**
    - About Interface
    - Touring The Toolbar
    - Options Palette Bar
    - Tabbed Palettes
    - Zoom Tool Interface
    - The Blank Canvas
    - Starting Out
    - Specific Size
    - Color Modes
    - Converting Color Modes
    - Opening A File
    - Resize Image
    - Resizing Canvas
    - Rotating And Flopping

- File browser intro
- Rotating and Ranking
- image organization
- rename and delete
- workspaces
- options at bottom
- organizing documents
- Saving Your File
- File types
- document sizes
- customize document
- Crop Tool
- Trimming Image
- Background Layer
- Creating A New Layer
- Re-arranging Layers
- auto color
- Presenting to Clients

- **Layers**
  - History Undo
  - Preference setting
  - Preserving States
  - Move Tool with Layers
  - Linking Layer Movement
  - Layer Sets
  - Move Via Layer Sets
  - Locking Layer Movement
  - Layer Transparency
  - Layer Set Transparency
  - Labeling Layers
  - Marquee Tool
  - Elliptical Marquee Tool
  - Constrained Aspect Tool
  - Saving A Selection
  - Moving A Selection
  - Histogram
  - Adjustment Layers
  - Layer Adjustments
  - Grouping Adjustments
  - curves zoom box
  - Auto Curves
  - Brightness / Contrast
  - Levels
  - Output Levels
  - RGB Levels
  - Hue / Saturation
  - Desaturate
  - Cloning Out Problems
  - Cloning Document
  - Color Picking
  - Eyedropper Tool
  - Other Imaging Tools
  - Blur
  - Sharpen
  - Dodge
  - Burn
  - Eraser
  - Saturate-Desaturate
- **Brushes & Text**
  - Healing Brush
  - healing brush

- patch tool
- Type Tool
- Text Boxes
- Font Size
- Type Kerning
- Type Leading
- Type Tracking
- Faux Fonts
- Vertical and Horizontal
- Warp Text
- Coloring Logo
- Image Transparency
- Gradient
- Gradient Editor
- Gradient Layer
- Image Adjustments
- Invert
- Threshold
- Gradient Map
- Transformations
- Free Transform
- Transforming Type
- layer mask
- creating mask
- disable mask
- painting on mask
- vector mask
- quick mask
- Paint Bucket
- Custom Shape
- custom brush
- Filters Intro
- Motion Blur
- Radial Blur
- Noise Filters
- Wave Filters
- Fading Filters

Coloring

- Grouping
- Adjustment Grouping
- Grouping Layer Sets
- Liquify
- Liquify
- Multiply
- Screen
- Dissolve
- Color
- Saturation
- Coloring Black and White Artwork
- Colorizing Photos
- Airbrush Tool
- Paintbrush
- Pencil
- Clone Stamp
- Keyboard Brush Shortcuts
- Straight Lines
- batch rename
- What Are Effects
- Deleting Effects
- Drop Shadow
- Inner Shadow

- Inner Glow
- Outer Glow
- Bevel and Emboss
- Satin
- Color Overlay
- Gradient Overlay
- Pattern Overlay
- Stroke
- Pasting Effects
- Blending Options
- Capturing Styles
- Drawing Effects
- pattern maker
- Picture Package
- Creating Actions

B.Voc (Software Development) 4th Semester

General Components

Paper Code- GBVOC-VI-401

Communicative English Credit – 3 Full Marks – 50

Reading : Effecting reading, skimming and scanning, reading comprehension.

Writing : Concept of good and effective writing, gist and summaries, writing advertisements, business letter writing.

Speaking : Group discussion (GD), Debate, Extempore, Mock Interview, Presentation and Role Play etc. turn-taking and gap-fillers.

Writing : Report writing, CV writing, E-mail, Fax, Notices, Agenda, Minutes.

Paper Code- GBVOC-VI-405

Physics Credit – 3 Full Marks – 50

Current Electricity

Thermoelectricity: seebeck , peltire and Thomson effect,laws of thermoelectricity, thermoelectric curve- neutral and inversion temperature.

Magnetic effect of current : Biot and Savart's law, ampere's circuital law (statement only), magnetic field due to a straight conductor, circular coil, solenoid, Ampere's equivalence theorem.

Steady Current : Network analysis — Kirchoff's laws, Thevnin and Norton's theorem, Wheatstone bridge, potentiometer.-

Lorentz force : Force on a moving charge in simultaneous electric and magnetic fields, force on a current carrying conductor in a magnetic field.

Varying currents : growth and decay of currents in L-R circuit; charging and discharging of capacitor in C-R circuit.

Alternating current : Mean and r.m.s. values of current and emf with sinusoidal wave form; LR, CR and series LCR circuits.

Paper Code- GBVOC-VI-406

Electronics Credit – 3 Full Marks – 50

Instrumentation

Regulated Power Supply: Construction of a power supply with rectifier, filter, zener and IC regulator.

Cathode ray oscilloscope: Block diagram of CRO, cathode ray tube (CRT), construction, basic principles of focusing and deflection of electron beam, basic elements of a CRO.

Meters: DC ammeters, voltmeters, voltmeter sensitivity, ohm meter, ammeter (series, and shunt types), basic features of analog and digital multimeter (DMM), digital voltmeter (DVM) (block diagram, A-D conversion techniques, display).

Signal Generators: Generation of sinusoidal, square wave and triangular waves, Function generator (block diagram).

Paper Code- GBVOC-VI-407

Mathematics Credit – 3 Full Marks – 50

Determinants up to the third order :Properties, Cofactor and Minor. Product of two determinants. Adjoint, Symmetric and Skew-symmetric determinants. Solutions of linear equations with not more than three variables by Cramer's Rule.

Matrices of Real Numbers :Equality of matrices. Addition of matrices. Multiplication of a matrix by a scalar. Multiplication of matrices – Associative properties. Transpose of matrix – its properties. Inverse of a non-singular square matrix. Symmetric and Skew-symmetric matrices. Scalar matrix. Orthogonal matrix. Elementary operations on matrices.

Skilled Components

Paper Code - SBVOC-SWD-VI 401

WEB APPLICATION DEVELOPMENT USING ASP.NET Credit – 5 Full Marks – 80

- ASP.Net (C# Programming) with SQLSERVER
- Overview of the ASP.NET
  - Introduction of different Web Technology
  - What is Asp.Net
  - How Asp.Net Works
  - Use of visual studio
  - Different Languages used in Asp.Net.
- Framework
  - Common Language Runtime (CLR)
  - .NET Framework Class Library.
- Setting up and Installing ASP.NET
  - Installing Internet Information Server
  - Installation of Asp.Net
  - Virtual directory
  - Application Setting in IIS.
- Microsoft SQL Server
  - Overview of SQL Server
  - Installation of SQL Server
  - Features of SQL Server Express
  - SQL Server 2008 Express management tools
- SQL Server Basic
  - Database Architecture
  - Data Manipulation Language (DML)
  - Data Definition Language (DDL)
  - Manipulation of Data (SQL Command)
  - Stored Procedure
  - Function
  - Trigger

- Views
- Cursor
- Coding Standards
- Overview of coding standards follows during programming
- Asp.Net Standard Controls
- Displaying information
- Label Controls
- Literal Controls
- Bulleted List
- Accepting User Input
- Textbox controls
- RadioButton and RadioButtonList Controls
- CheckBox and CheckBoxList Controls
- Button controls
- LinkButton Control
- ImageButton Control
- Using Hyperlink Control
- DropDownList
- ListBox
- Displaying Images
- Image Control
- Image Map Control
- Using Panel Control
- Using Hyperlink Control
- Asp.Net
- Page & State Management
- Asp.Net Validation Controls + Javascript Validation
- Required Field Validator Control
- Regular Expression Validator Control
- Compare Field Validator Control
- Range Validator Control
- Validation Summary Control

- Custom Validator Control

o Designing Websites with master pages

- Creating master pages
- Creating default contents
- Nesting master pages
- Registering master pages in web configuration

o Using the Rich Controls

- Accepting File Uploads
- Saving files to file system
- Calendar Control
- Displaying advertisements
- Displaying Different Page view
- Displaying a Tabbed Page View
- Wizard Control

o Overview of Data Access

- Creating database connections
- Connecting to MSSQL Server and MS Access
- DataSet&DataTable Features
- Using inline SQL Statements
- Using Stored Procedures
- Executing select commands
- Sql Transaction

o C#

- Data Type and syntax Language Fundamentals
- Classes
- Namespaces
- Object Oriented Programming concepts
- Overview of Asp.Net inbuilt Classes and method
- File Handling

o Using the Grid View Control

- Grid View Control fundamentals
- Displaying Data

- Using Data Keys
- Sorting Data
- Paging through Data

o Using the Details View and Form View Controls

- Using the Details View control
- Displaying data with the DetailsView control
- Using Fields with the DetailsView control
- Displaying Empty data with the DetailsView control

o Using Repeater and Data List Controls

- Using Repeater Control
- Displaying data with the Repeater Control
- Displaying Data with the Data List Control

o Using Navigation Controls

- Understanding Site Maps
- Using the Sitemap Path Control
- Formatting the Sitemap Path Control
- Using the Menu Control
- Using Tree View Control

o Working with XML and Web Services

- Overview of XML
- Creating /Reading/Deleting XML Files
- Web Services

o AJAX (Asynchronous JavaScript and XML)

- About Ajax
- Setting up and implementing Ajax

o FTP Management

- Understanding FTP
- Setting up FTP Server (Live)
- Uploading and downloading FTP contents

o Sending Emails

- Designing email panel
- How to send an email to various users

- Sending auto emails

o Deployment

- Deploying application on Web Server

Paper Code - SBVOC-SWD-VI 402

PROGRAMMING WITH CORE JAVA Credit – 5 Full Marks – 80

Introduction to Object Oriented Programming

- OOPs Concept and Introduction to JAVA
- An overview of Java
- Data Types-variables and arrays
- Operators and Control Statements
- Classes and objects, Inheritance String and string buffer, Packages, Interfaces
- Exception Handling, Multithreaded Programming Applets Event handling

Abstract window Toolkit

Paper Code - SBVOC-SWD-VI 403

UNIX/LINUX & SHELL PROGRAMMING Credit – 4 Full Marks – 70

1. Operating System Concepts
Overview of OS. System Calls, Process Management, Memory Management, Disk and filesystems, Networking, Security, Graphical User Interface, Device Drivers.

2. Linux Ideas and History
What is Open Source? , Linux Origins, Red Hat Distributions, Linux Principles

3. Linux Usage and Basics
Logging in to a Linux System, Switching between virtual consoles and the graphical environment, Elements of the X Window System, Starting the X server, Changing your password, The root user, Changing identities, Editing text files.

4. Running Commands and Getting Help
Running Commands, Some Simple commands, Getting Help, The whatis command, The –help Option, Reading Usage Summaries, The man command, Navigating man pages, The info command, Navigating info pages, Extended Documentation, Red Hat Documentation.

5. Browsing the File System
Linux File Hierarchy Concepts, Some Important Directories, Current Working Directory, File and Directory Names, Absolute and Relative Pathnames, Changing Directories, Listing Directory Contents, Copying Files and Directories, Copying Files and Directories: The Destination, Moving and Renaming Files and Directories, Creating and Removing Files, Creating and Removing Directories, Using Nautilus, Determining File Content.

6. The X-Window System
XOrg: The X11 Server, XOrg Server Design, XOrg Server Configuration, XOrg Modularity, Server and Client Relationship, XOrg in runlevel 3, XOrg in runlevel 5, Configuration Utilities, Remote X

Sessions.

7. Users, Groups and Permissions
Users, Groups, Linux File Security, Permission Precedence, Permission Types, Examining Permissions, Interpreting Permissions, Changing File Ownership, Changing Permissions – Symbolic Method, Changing Permissions – Numeric Method, Changing Permissions – Nautilus

8. Advanced Topics in Users, Groups and Permissions User and Group ID Numbers, /etc/passwd, /etc/shadow and /etc/group files, User Management tools, System Users and and Groups, Monitoring Logins, Default Permissions, Special Permissions for Executables, Special Permissions for Directories.

9. The Linux File System In-depth
Partitions and Filesystems, Inodes, Directories, Inodes and Directories, cp and inodes, mv and inodes, rm and inodes, Hard Links, Symbolic (or soft) Links, The Seven Fundamental Filetypes, Checking Free Space, Removable Media, Mounting CDs and DVDs, Mounting USB Media, Mounting Floppy Disks, Archiving Files and Compressing Archives, Creating, Listing and Extracting File Archives, Creating File Archives: Other Tools.

10. vim: An Advanced Text Editor
Introducing vim, vim: A Modal Editor, vim basics, Opening a file in vim, Modifying a file, Saving a file and exiting vim, Using Command Mode, Moving around, Search and Replace, Manipulating Text, Undoing changes, Visual Mode, Using multiple “windows”, Configuring vi and vim, Learning more.

11. Standard I/O and Pipes
Standard Input and Output, Redirecting Output to a File, Redirecting STDOUT to a Program(Piping), Combining Output and Errors, Redirecting to Multiple Targets (tee), Redirecting STDIN from a file, Sending Multiple Lines to STDIN.

12. Using the Bash Shell
Bash Introduction, Bash Heritage and Features, Command Line Shortcuts, History Tricks, Command Line Expansion, Command Editing Tricks, gnome-terminal

13. Configuring the Bash Shell
Bash Variables, Environment variables, The TERM Environment variable, The PATH Environment variable, Some common variables, Aliases, How bash expands a Command Line, Preventing Expansion, Login vs non-login shells, Bash startup tasks: profile, Bash startup tasks: bashrc, Bash exit tasks
14. Text Processing Tools
Tools for Extracting Text, Viewing File Contents, Viewing File Excerpts, Extracting Text by Keyword, Extracting Text by column, Tools for analyzing text, Gathering text statistics, Sorting Text, Eliminating Duplicate Lines, Comparing Files, Duplicating File Changes, Spell Checking with aspell, Tools for manipulating Text, sed, Special Characters for Complex Searches.

15. Shell Programming
Scripting Basics, Creating Shell Scripts, Generating Output, Handling Input, Exit Status, Control Structures, Conditional Execution, File Tests, String Tests, for and sequences, continue and break, Using positional parameters, handling parameters with Spaces, Scripting at the command line, Shell Script debugging.

16. Investigating and Managing Process
What is a Process? Listing Processes, Finding Processes, Signals, Sending Signals to Processes, Scheduling Priority, Altering Scheduling Priority, Interactive Process management tools, Job Control, Scheduling a Process to execute later, Crontab File format.

17. Finding and Processing Files
Locate, Locate Examples, find, Basic find Examples, find and Logical Operators, find and Permissions, find and Numeric Criteria, find and Access Times, Executing commands with find, find Execution Examples, The GNOME Search Tool.

18. Basic System Configuration Tools
TCP/IP Network Configuration, Managing Ethernet Connections, Graphical Network Configuration, Network Configuration Files, Printing in Linux, Setting the System's Date and Time, Managing Services.

Paper Code - SBVOC-SWD-VI 404

Multimedia Technology Credit – 4 Full Marks – 70

- **Adobe Premiere Pro Basics Training**
  - Nonlinear editing in Adobe Premiere Pro
  - Expanding the workflow
  - Touring the Adobe Premiere Pro workspace
- **Setting up a Project**
  - Setting up a project
  - Setting up a sequence
- **Importing Media**
  - Importing assets
  - Working with the Media Browser
  - Importing images
  - The media cache
- **Organizing Media**
  - The Project panel
  - Working with bins
  - Organizing media with content analysis
  - Monitoring footage
  - Modifying clips
- **Essentials of Video Editing**
  - Using the Source Monitor
  - Navigating the Timeline
  - Essential editing commands
- **Working with Clips and Markers**
  - Program Monitor controls
  - Controlling resolution
  - Using markers
  - Using Sync Lock and Track Lock
  - Finding gaps in the Timeline

- Selecting clips
- Moving clips
- Extracting and deleting segments

❖ **Adding Transitions**
- What are transitions?
- Edit points and handles
- Adding video transitions
- Using A/B mode to fine-tune a transition
- Adding audio transitions

❖ **Advanced Editing Techniques**
- Four-point editing
- Retiming clips
- Replacing clips and footage
- Nesting sequences
- Regular trimming
- Advanced trimming
- Trimming in the Program Monitor panel

❖ **Putting Clips in Motion**
- Adjusting the Motion effect
- Changing clip position, size, and rotation
- Working with keyframe interpolation
- Using other motion-related effects

❖ **Multicamera Editing**
- The multicamera process
- Creating a multicamera sequence
- Switching multiple cameras
- Finalizing multicamera editing

❖ **Editing and Mixing Audio**
- Setting up the interface to work with audio
- Examining audio characteristics
- Adjusting audio volume
- Creating a split edit
- Adjusting audio levels in a sequence

❖ **Sweetening Sound**
- Sweetening sound with audio effects
- Adjusting EQ
- Applying effects in the Audio Mixer
- Cleaning up noisy audio

❖ **Adding Video Effects**
- Working with effects
- Keyframing effects
- Effects presets
- Frequently used effects

❖ **Color Correction and Grading**
- Color-oriented workflow
- An overview of color-oriented effects
- Fixing exposure problems
- Fixing color balance

- Special color effects
- Creating a look

❖ **Exploring Compositing Techniques**
- What is an alpha channel?
- Making compositing part of your projects
- Working with the Opacity effect
- Working with alpha-channel transparencies
- Color keying a greenscreen shot
- Using mattes

❖ **Creating Titles**
- An overview of the Titler window
- Video typography essentials
- Creating titles
- Stylizing text
- Working with shapes and logos
- Making text roll and crawl

❖ **Managing Your Projects**
- The File menu
- Using the Project Manager
- Final project management steps
- Importing projects or sequences
- Managing collaboration
- Managing your hard drives

❖ **Exporting Frames, Clips, and Sequences**
- Overview of export options
- Exporting single frames
- Exporting a master copy
- Working with Adobe Media Encoder
- Exchanging with other editing applications
- Recording to tape

B.Voc (Software Development) 5th Semester

General Components

Paper Code- GBVOC-VII-501

Communicative English Credit – 3 Full Marks – 50

English for Specific Purposes (ESP) : What is ESP? Vocabulary related to travel and tourism, hospitality, airlines, banking, corporate world, media, sports, etc.
English for academic purposes(EAP), GD, Interview techniques (questions).

Paper Code- GBVOC-VII-502

Communicative Hindi Credit – 3 Full Marks – 50

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Paper Code- GBVOC-VII-503

Electronics Credit – 3 Full Marks – 50

Analog Communication and digital communication:

II. Analog Communication
Analog Modulation: Need for modulation, modulating signal, need for carrier signal, types of modulation.
Amplitude modulation (AM): Mathematical representation, modulation index and percentage modulation.
Frequency (FM) and Phase Modulation (PM): Mathematical representation of FM and PM, maximum frequency deviation, modulation index, bandwidth in FM.
III. Digital communication
Sampling theorem, Pulse modulation, PPM, PWM, ASK,PSK,FSK basic concept.

Paper Code- GBVOC-VII-504

Quantitative Aptitude Credit – 3 Full Marks – 50

Unit 1 – Numbers
Unit 2 - H.C.F. and L.C.M. of Numbers
Unit 3 - Square Root and Cube Root
Unit 4 - Simplification
Unit 5 - Percentage
Unit 6 - Average
Unit 7 - Ratio and Proportion
Unit 8 - Partnership
Unit 9 - Profit and Loss

Skilled Components

Paper Code- SBVOC-SWD-VII-501

PROGRAMMING WITH C#.NET Credit – 5 Full Marks – 80

- **MS.NET Framework Introduction**
  - The .NET Framework - an Overview
  - FrameworkComponents
  - FrameworkVersions
  - Types of Applications which can be developed usingMS.NET
  - MS.NET Base ClassLibrary
  - MS.NETNamespaces
  - MSIL / Metadata and PEfiles.
  - The Common Language Runtime (CLR)
  - ManagedCode
  - MS.NET Memory Management / GarbageCollection
  - Common Type System (CTS)
  - Common Language Specification(CLS)
  - Types of JITCompilers
  - SecurityManager
- **VS.NET and Entry Point Method –Main**
  - Introduction to Project and Solution inStudio
  - Entry point method -Main.
  - Compiling and BuildingProjects
  - Using Command LineArguments
  - Importance of Exit code of anapplication
  - Different valid forms ofMain
  - Compiling a C# program using commandline utilityCSC.EXE
- **C # Language Syntax**
  - WhyDatatypes
  - Global, Stack and HeapMemory
  - Common TypeSystem
  - Reference Type and ValueType
  - Datatypes & Variables Declaration
  - Implicit and ExplicitCasting
  - Checked and Unchecked Blocks – OverflowChecks
  - Casting between otherdatatypes
  - Boxing andUnboxing
  - Enum andConstant
  - Operators
  - Control Statements
  - Working withArrays
  - Working withMethods
  - Pass by value and by reference and outparameters
- **Developing GUI Application Using WINFORMS**
  - BasicControls
  - Panel &Layouts
  - Drawing and GDIDevices
  - MenuStrip, ToolbarStrip andContextMenuStrip
  - Model and Modeless Dialogboxes
  - Mutiple Document Interface(MDI)
  - FormInheritance
  - Building LoginForm

- Working with Resource Files andSetting
- Notify IconControls
- Using Components like Timer, FileSystemWatcher, Process,BackgroundWorker
- Drag andDrop
- Working with Advanced Controls like TreeView and ListView

- **Database Programming Using ADO.NET**
  - Prerequisite - Knowledge of SQLQueries
  - Introduction and Evolution ofADO.NET
  - Understanding the Role of Managed Provider and ADO.NETObjects
  - installing Required Software - Sql Server and Managementstudio
  - Connecting to Database and ConnectionPooling
  - Performing Insert, Update and DeleteOperations
  - Fetching Data from database - Executing SelectStatements
  - How to implement Login facility withdatabase
  - Use of Multiple Active ResultSets
  - Parameterized PreparedStatements
  - Inserting Image into Databasetable
  - Executing StoredProcedure
  - UsingTransaction
  - Asynchronous Execution ofQueries
  - Writing Provider IndependentCode
  - Writing Common Code for Execution of StoredProcedures
  - Quick Overview of all ADO.NETobjects
- **Managing Data using DataSet**
  - Introduction DataSet and its ObjectModel
  - Filling DataSet usingDataAdapter
  - Binding DataSet toDataGridView
  - Updating changes to database usingDataAdapter
  - UsingSqlCommandBuilder
  - Managing DataTableProgrammatically
  - DataAdapterevents
  - Handling concurrencyissue
  - Working withDataViews
  - Constraints inDataTable
  - Using DataRelationsobject
  - Creating DataSet/DataTabledynamically
  - Working with TypedDataSet
  - Summary and Important Classes and their properties andmethods
- **N-Tier Layered Architecture Application**
  - Understanding Tier and Layer
  - Dividing Application into multiple layers
  - Developing an application using Layered Architecture
    - Creating Table and Stored Procedure
    - Creating Data Class
    - Creating DAL Class
    - Creating BO Class
    - Creating Form and handlingevents
    - Creating Dialog Box for Add and Edit OPerations.
- **Windows Services**
  - Introduction to Windows Service
  - Windows Service Project Template
  - Developing Windows Services
  - Installing, Deploying and Launching Windows Service
  - Developing a Service Controller Application

- Handling Custom Commands in Windows Services

- **Delegates & Events**
  - Introduction to Delegates
  - Creating a Chat Application Using Delegates
  - Events Declaration, Raising and Handling
  - Anonymous Methods
- **User Control and Custom Control**
  - Threading Overview
  - Scheduling
  - Thread States
  - Programming Threads
  - Methods of Thread Class
  - Thread Pool
  - Thread Synchronization
    - ✓ Monitor
    - ✓ Mutex
    - ✓ Semaphore
    - ✓ Events
  - Parallel Programming using Task Parallel Library
  - Asynchronous Programming using async and wait keywords
- **Packaging and Deployment**
  - File System Editor
  - Registry Editor
  - File Types Editor
  - User Interface Editor
  - Custom Actions
  - Launch Condition Editor
  - Creating Uninstall Shortcut
- **Debugging and Diagnostics**
  - What is Debugging?
  - Build Configuration(Debug and Release)
  - List of Debugging Windows
  - Break Point Hit Count and Condition
  - Debugging Exception
  - What is Diagnostics?
  - Debug and Trace Classes
  - Types of Listeners
  - Boolean and Trace Switch

Paper Code- SBVOC-SWD-VII-502

WEB DEVELOPMENT USING PHP AND MYSQL Credit – 5 Full Marks – 80

- **HTML 5**
  - What is HTML5?
  - HTML5 Basic Syntex
  - H1,H2, and other tags
  - Normal tags and semantic tags
  - Hyperlinks
  - Table
  - HTML5 form
  - HTML 5 form validation
- **CSS 3**
  - What is CSS?
  - Basic syntax of CSS
  - Font, Color and Size
  - Div/CSS
  - Create basic layout with CSS
- **Bootstrap**
  - What is Bootstrap?
  - Why Use Bootstrap
  - Bootstrap Download & Installation
  - Understanding Grid System
  - Tables
  - Buttons
  - Modal Box
  - Tabs
- **Wordpress**
  - Introduction To Wordpress Section
  - What Is Wordpress?
  - The Wordpress Dashboard
  - Wordpress Themes
  - Important: A note about X Theme and the next lecture
  - Creating A Blog
  - Creating An Ecommerce Site
  - Wordpress Challenge - Create A Site
- **PHP**
  - PHP Intro
  - PHP Install
  - PHP Syntax
  - PHP Variables
  - PHP String
  - PHP Operators
  - PHP If...Else
  - PHP Switch
  - PHP Arrays
  - PHP Sorting Arrays
  - PHP While Loops
  - PHP For Loops
  - PHP Functions
  - PHP Forms
  - PHP $_GET
  - PHP $_POST

- PHP Arrays Multi
- PHP Date
- PHP Include
- PHP File
- PHP File Upload
- PHP Cookies
- PHP Sessions
- PHP E-mail
- PHP Secure E-mail
- PHP Error
- PHP Exception
- PHP Filter

❖ **MySql**

- SQL Intro
- SQL Syntax
- SQL SELECT
- SQL SELECT DISTINCT
- SQL WHERE
- SQL AND & OR
- SQL ORDER BY
- SQL INSERT INTO
- SQL UPDATE
- SQL DELETE
- SQL Advanced
- SQL SELECT TOP
- SQL LIKE
- SQL Wildcards
- SQL IN
- SQL BETWEEN
- SQL Aliases
- SQL Joins
- SQL INNER JOIN
- SQL LEFT JOIN
- SQL RIGHT JOIN
- SQL FULL JOIN
- SQL UNION
- SQL SELECT INTO
- SQL INSERT INTO SELECT
- SQL CREATE DB
- SQL CREATE TABLE
- SQL Constraints
- SQL NOT NULL
- SQL UNIQUE
- SQL PRIMARY KEY
- SQL FOREIGN KEY
- SQL CHECK
- SQL DEFAULT
- SQL CREATE INDEX
- SQL DROP
- SQL ALTER
- SQL Auto Increment
- SQL Views
- SQL Dates
- SQL SQL NULL Values
- SQL NULL Functions

- SQL General Data Types
- SQL DB Data Types

❖ **JAVASCRIPT**

- Basic Javascript
- Javascript Basic Tags
- String
- Array
- Functions

❖ **Jquery**

- jQuery - Overview
- jQuery - Basics
- jQuery - Selectors
- jQuery - Attributes
- jQuery - Traversing
- jQuery - CSS
- jQuery - DOM
- jQuery - Events
- jQuery - AJAX
- jQuery – Effects

Paper Code- SBVOC-SWD-VII-503

PROGRAMMING WITH ADVANCED JAVA(JSP) Credit – 5 Full Marks – 80

Oops concept (revised all), introduction advanced java

JDBC – Java Database Connectivity

Introduction to JDBC, JDBC Drivers & Architecture, CURD operation Using JDBC, Connecting to non-conventional Databases.

Java Servlets

Java Server Technologies Servlet Web Application Basics, Architecture and challenges of Web Application, Introduction to servlet, Servlet life cycle, Developing and Deploying Servlets, Exploring Deployment , Descriptor (web.xml), Handling Request and Response.

JSP (Java Server Pages)

Introduction to JSP , Life cycle of JSP ,Disadvantages of Servlet ,JSP Components ,Custom Tags ,JSP implicit objects, Accessing database from JSP ,Using JavaBeans with JSP ,Working with JSP Standard action tags ,Working with expression language, Error Handling in a jsp , Creating custom tags , JSTL (Java Server Pages Tag Library)

Paper Code- SBVOC-SWD-VII-504

INTRODUCTION TO PYTHON Credit – 3 Full Marks – 60

Introduction to python installation and working with Python understanding Python variables.
Python basic operators understanding python.
Python data types declaring and using numeric data types :int, float, complex.
Data type and string operations declaring list and list data drive data type.
Python program flow control conditional blocks using if else and else if simple for loops in Python for loop using ranges commerce.
stream command list and dictionaries use of while loops in Python.
Loop manipulation using pass break and else programming using Python conditional and loops block.
Python functions modulus and packages organising Python codes using functions organising python project into module importing on module as well as external module programming using functions module and external packages python string list and dictionary manipulation.
Understanding string inbuilt methods list, inbuilt methods dictionary, programming using using string list and dictionary inbuilt function.
Python file operation reading config files in Python writing log files in Python understanding read functions read(),readline() and readlines() understanding write functions write() And writelines() manipulating file pointer using seek programming using file operation.
Python object oriented programming oops concept of class object and instances constructor class attributes and destructors real time class in live projects inheritance overlapping overloading operators adding and retrieving dynamic attributes of classes programming using oops support.
Python Regular expression, pattern matching and searching, pattern searching using regex in Python pattern finding programs using regular expression.
Python exception handling, code break using exception handling, file operation using exception handling, developer with error code using exception handling.
Python database interaction SQL database using Python creating and searching, reading and sorting config information on database programming using database connection.
Python multithreading understanding threads synchronising the threads programming using multithreading sample project

B.Voc (Software Development) 6th Semester

General Components

Paper Code- GBVOC-VII-601

Communicative English Credit – 3 Full Marks – 50

Presentation, public speaking skills,
Accuracy and Fluency in English Conversation,
Mock Interview, business communication.

Paper Code- GBVOC-VII-602

Communicative Hindi Credit – 3 Full Marks – 50

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Paper Code- GBVOC-VII-604

Electronics Credit – 3 Full Marks – 50

Embedded system
Microcontroller: concept, different types of micro-controller, 8051 family, basic programming with assembly
language and C. AVR series microcontroller, Arduino concept and programming.
Digital system design: VHDL or Verilog programming, basic digital circuit design program, half adder, 2:1 MUX.

Paper Code- GBVOC-VII-606

Quantitative Aptitude Credit – 3 Full Marks – 50

Unit 1 - Time and Work, Work and Wages

Unit 2 - Pipes and Cisterns

Unit 3 - Time and Distance

Unit 4 - Boats and Streams

Unit 5 - Races and Games of Skill

Unit 6 - Alligation or Mixture

Unit 7 - Problems on Ages

Unit 8 - Simple Interest

Unit 9 - Compound Interest

Skilled Components

Paper Code- SBVOC-SWD-VII-601

Management Information System (MIS) Credit – 3 Full Marks – 50

Unit 1: Understanding MIS: Introduction to Management Information Systems, History of MIS, Impact of MIS, Role and Importance, MIS Categories, Managers and Activities in IS, Types of Computers Used by Organizations in Setting up MIS, Hardware support for MIS

Unit 2: Conceptual Foundations : Introduction, The Decision Making Process , System Approach to Problem Solving, The Structure of Management Information System

Unit 3: Kinds of Information Systems: Introduction, Types of Management Systems Concepts of Management Organization

Unit 4: Planning and Control: Introduction, Differences between planning and control information, Systems Analysis, Systems Design

Unit 5: MIS Planning and Development : Introduction, Planning, development

Unit 6: MIS and BPR : Introduction, Business Process Re – Engineering, Improving a process in BPR, Object Oriented methodology, BPR – Current Focus

Unit 7: MIS Organization Structure : Introduction, MIS at Management levels, Strategic Level Planning, Operational Level Planning,Economic and Behavior Theories.

Unit 8: Enterprise Resource Planning: Introduction, Basics of ERP, Evolution of ERP, Enterprise Systems in Large Organizations, Benefits and Challenges of Enterprise Systems

Unit 9: E-Enterprise System : Introduction: Managing the E-enterprise, Organisation of Business in an E-enterprise, E-business, E-commerce, E-communication, E-collaboration,

Unit 10: Trends in MIS: Introduction, Decision Support Systems (DSS), Artificial Intelligence (AI)

Unit 11: MIS – Support Models and Knowledge Management: Introduction, Philosophy of Modelling, DSS: Deterministic Systems, Market Research Methods, Ratio Analysis for Financial Assessment, Management Science Models, Procedural Models, Project Planning

and Control Models, Cost Accounting Systems, Operations Research Models: Mathematical Programming Techniques, Knowledge Management

Unit 12: Organization and Computer Networks: Introduction, Basics of computer systems, Basic Network Terminologies, Definitions and Application, The Intranet and the Extranet

Unit 13: Database Management Systems: Introduction, Types of Database Users, DBMS, Designing of DBMS

Unit 14: Strategic Management Information System: Introduction, Background, Performance, Product differentiation and Value Chain, How IT influences Organizations' goals, The five levels, Governance Modes in the use of IT

Unit 15: Security and Ethical Issues: Introduction, Control Issues in Management Information Systems, Security Hazards, Ethical Issues, Technical solutions for Privacy Protection

Paper Code- SBVOC-SWD-VII-602

Entreprenurship Development Credit – 3 Full Marks – 50

Unit-I Entrepreneurs hip Development - Concept and Scope

1. Entrepreneurship as a career
2. Traits of successful intrapreneur/ entrepreneur: consistency, creativity, initiative, independent decision making, assertiveness, persuasion, persistence, information seeking, handling business communication, commitment to work contract, calculated risk' taking.
3. Entrepreneurship : scope in local and global market.
4. Intrapreneur and entrepreneur
5. Types of enterprises and their features: manufacturing, service and trading.
6. Steps in setting up of a business.

Unit – II Entrepreneurial Opportunities and selection process

1. Product/Service selection: Process, core competence, product/service life cycle, new product/ service development process, mortality curve, creativity and innovation in product/ service modification / development.
2. Process selection: Technology life cycle, forms and cost of transformation, factors affecting process selection, location for an industry, material handling.
3. Market study procedures: questionnaire design, sampling, market survey, data analysis

Unit – III Support Systems

Unit IV Business Plan Preparation

1. Sources of Product for Business : Feasibility study
2. Ownership, Capital, Budgeting, Matching entrepreneur with the project, feasibility report preparation and evaluation criteria
3. Business plan preparation

Unit -V Managing Enterprise

1. Unique Selling Proposition [U.S.P.]: Identification, developing a marketing plan.
2. Preparing strategies of handling business: policy making, negotiation and bargaining techniques.
3. Risk Management: Planning for calculated risk taking, initiation with low cost projects, integrated futuristic planning, angel investors, venture capitalist.
4. Incubation centres: Role and procedure.
5.

Paper Code- SBVOC-SWD-VII-603

Live Industrial Project Credit – 10 Full Marks – 150

- **Technologies Given**
  - **.Net (ASP.Net / C#.Net)**
  - **JSP**
  - **PHP**
  - **Multimedia**

Paper Code- SBVOC-SWD-VII-604

Seminar & Grand Viva Credit – 2 Full Marks – 50