RANI DURGAVATI VISWAVIDYALAYA, JABALPUR  
Bachelor of Computer Applications (BCA)  
Scheme of Examination for BCA Course (Regular) for all Affiliated Colleges of RDVV

### BCA- I SEM

<table>
<thead>
<tr>
<th>Course Code</th>
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<td>P C Package</td>
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<td>Programming in C</td>
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Minimum Passing marks in Theory : 40 % and Practical : 50%

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<td>BCA-205</td>
<td>System Analysis &amp; Design and MIS</td>
<td>70</td>
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<tr>
<td>BCA-206</td>
<td>Computer Lab-II (HTML, JavaScript, C++)</td>
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<td>BCA-302</td>
<td>Data Structure</td>
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<td>Mathematical Foundation</td>
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<td>Programming in VB.Net</td>
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<td>Theory of Operating System</td>
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<td>Computer Network</td>
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<td>Programming In Java</td>
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<td>Programming with ASP.net</td>
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<tr>
<td>BCA-601</td>
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<td>BCA-602</td>
<td>Cloud Computing</td>
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<td>BCA-603</td>
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<td>BCA-604</td>
<td>Viva Voce</td>
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Total Marks 500

Minimum Passing marks in Theory: 40% and Practical: 50%

### Examination Pattern:

End semester examination will contain three sections as A, B & C

Section-A will be of objective type, Section- B will have short answers & Section- C will consist of long answers. Marks distribution for all sections will be as follows:

Section- A 1*10=10 marks

Section- B 4*5=20 marks

Section- C 8*5=40 marks

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Total =70 marks

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## BCA FIRST SEMESTER

### BCA - I SEM

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**Total Marks 600**

Minimum Passing marks in Theory : 40 % and Practical : 50%

### BCA-101: FUNDAMENTALS OF COMPUTER AND PROGRAMMING

Max. Marks-70, Min. Marks - 28

**UNIT-I**

**COMPUTER INTRODUCTION TO COMPUTER:** Computer system characterization & capabilities. Speed, Accuracy, Reliability, Memory Capability, Repeatability. **COMPUTER HARDWARE & SOFTWARE:** Block Diagram of a Computer, Different Types of Software’s. **TYPES OF COMPUTER:** Analog Digital & Hybrid, General and Special Purpose Computers. **COMPUTER GENERATIONS:** Characteristics of Computer Generations Computer Systems Micros, Minis & Mainframes. **INTRODUCTION TO PC:** The IBM Personal Computer, Type of PC systems PC, XT & AT, Pentium PCS, Limitations of Micro-computer.

**UNIT-II**

UNIT-III
DATA PROCESSING: DATA, Data Processing system, Storing Data, Processing data. CENTRAL PROCEEDING UNIT: The Microprocessor Control Unit, ALU, Register, Buses Main Memory, Main Memory (RAM) for Microcomputers, Read-only Memory. COMPUTER OUTPUT: Output Fundamentals, Hardcopy Output Devices, Impact printers, Non-Impact printer’s plotters, Computer Output Microfilm/Microfiche (COM) System, Softcopy output Devices, Cathodes Ray Tube and Flat Screen Technologies.

UNIT-IV

UNIT-V

TEXT BOOK:

Books:
1. Computer Fundamentals By P.K. Sinha
2. O’ Level Module 1 by V.K. Jain
3. O’ Level Mode Simple BySatish Jain
4. Essential of IT (Hindi Medium) –Pragya Publication

Note: There Shall be Ten Questions in the question paper, Two questions from each unit. The student will have to Attempt five questions, selecting one question from each unit.
BCA-102: OPERATING SYSTEMS (DOS & WINDOWS, UNIX)

Max. Marks-70,
Min. Marks – 28

UNIT-I

DOS:-Introduction - History & Version of DOS.DOS Basics-Physical structure of disk, drive name, FAT, file & directory structure and naming rules, Booting process, DOS system files.DOS Commands – Internal – Dire, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME CLS, PATH, TYPE.
External- CHKDSK, XCOPY, PRINT, DISKCOPY, DISCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB HELP, SYS.

UNIT-II


UNIT-III

An overview of UNIX and historical perspective, understanding UNIX commands arguments, options and filename, Combining commands, Entering a command before previous command has finished (pg. 1-38).

UNIT-IV

General purpose utilities – cal, data, cal, who, try, uname, password, lock, ehco, bc, time, spell, ispell, file, system, ordinary files, directory files, device files, special files pathname, mkdir, rmdir, Is(with options), cd (pg.41-67).

UNIT-V

Handling ordinary files displaying and creating files, copying, deleting, renaming files, pattern matching, painting a files, line, word and character counting, comparing two files, finding what is common. The shell, sh command pattern matching (wild cards), Quoting redirection (pg.69-93).

TEXT BOOKS:

1. AnnuragSeetha, Introductions to Computers and information Technology, RAM Prasad & Sons, Bhopal (UNIT-1)
2. Rajeev Mathur, Learning Window98 step by step, BPB Publication. (UNIT-II)

REFERENCE BOOKS-

1. Rajiv Mathur, Quick Reference DOS 6.2 Galagotia Publication.
2. Alan Simpsor, Easy Guide to Windows, BPB.
BCA-103: PC PACKAGE

UNIT-I

UNIT-II

UNIT-III
Advanced Features of MS Word, Spell Check, Thesaurus, Find & Replace; Headers & Footers, Inserting Page Numbers, Pictures, Files, Auto texts, Symbols, Working with Columns, Tabs & Indents, Creation & Working with Tables including conversion to and from text, Margins & Space management in Document, Adding References and Graphics, Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats.

UNIT-IV
MS Excel- Introduction and area of use, Working with MS Excel, concepts of Workbook & Worksheets, Using Wizards, Various Data Types, Using different features with Data, Cell and Texts, Inserting, Removing & Resizing of Columns & Rows, Working with Data & Ranges, Different Views of Worksheets, Column Freezing, Labels, Hiding, Splitting etc., Using different features with Data and Text; Use of Formulas, Calculations & Functions, Cell Formatting including Borders & Shading, Working with Different Chart Types; Printing of Workbook & Worksheets with various options.

UNIT-V
MS PowerPoint - Introduction & area of use, Working with MS PowerPoint, Creating a New Presentation, Working with Presentation, Using Wizards, Slides & it’s different views, Inserting, Deleting and Copying of Slides, Working with Notes, Handouts, Columns & Lists, Adding Graphics, Sounds and Movies to a Slide, Working with PowerPoint Objects, Designing & Presentation of a Slide Show, Printing Presentations, Notes, Handouts with print options. Outlook
Express, Features and uses, Configuration and using Outlook Express for accessing e-mails in office.

TEXT & REFERENCE BOOKS:
• WINDOWS XP COMPLETE REFERENCE. BPB PUBLICATIONS
• MS OFFICE XP COMPLETE BPB PUBLICATION
• MS WINDOWS XP HOME EDITION COMPLETE, BPB PUBLICATION.
• JOE HABRAKEN, MICROSOFT OFFICE 2000, 8 IN 1, BY, PRENTICE HALL OF INDIA
• I.T TOOLS AND APPLICATIONS, BY A. MANSOOR, PRAGYA PUBLICATIONS, MATURA

BCA-104: PROGRAMMING IN C

Max. Marks-70,
Min. Marks - 28

UNIT-I
Introduction, Data Types and operators identifiers and keywords, constants, types of operators, type conversion, writing a C-Program, variable declaration, C-Statements, Input and Output functions (pg 1-38)

UNIT-II
Control statement, conditional expressions if statement, if-else statement, case and switch statement, loop-statements: For loop, while loop, do while loop, Break, continue and go to statements (pg.39-69)

UNIT-III
Functions and program structure, Function definition, Type of functions, local and global variables, scope of variable, multifunction programs, Recursive functions. (pg.70-98)

UNIT-IV
Arrays Notation and declaration, initialization, multidimensional and character arrays, pointers, Declarations, Pointer arithmetic, pointers and functions. (pg.99-142)

UNIT-V
Preprocessors and macros, Header files (brief introductions only), structures, Declarations, initialization and use of structures in a C-Program function and structures, Array of structures Arrays within a structures. Unions. (pg.159-161, 168-169, 197-220, 230-233)

Text Book :

Reference Books:
3. Shridhar B. Dandin, Programming in C – Pragya Publication (Hindi Medium)
UNIT-I

COMPREHENSION: Comprehension includes understanding the language by reading and listing for that some interesting current passages of poems will be given to the student Individually or in Group and they are allowed to Read in the class by giving sufficient time. Then the comprehension will be tested checked by formulations various questionnaire in different ways such as objective type, Fill in the Blanks or small answer question Similarly the passages or poems will be read out in the class and the Question shall be asked Verbally to evaluate level of Comprehension. This would be to enhance their listening capability: Listening Comprehension: Talks. Reports, Poems.

UNIT-II

SECTION: B WRITING SKILLS
In this section the student will be exposed to various Techniques of writing such as paragraph. Report composition, Diary Entry, Application and letters. This count temporary Indian writing on culturally familiar topics and would promote inferential and Analytical learning apart from literary application.

B-1 PARAGRAPH WRITING
1. Objective
2. Introduction
3. The topic sentence
4. Developing the topic
5. Coherence Transitional devices.

B-2 COMPOSITION WRITING:
1. Objective
2. Introduction
3. A Model Composition for study
4. Type of Composition
   1. Expository
   2. Argumentative
   3. Narrative
   4. Descriptive
   5. Tech Techniques of writing & good composition.

UNIT-III

B-3 NOTE MAKING TALKING
1. Objective
2. Introduction
3. How to read
4. Specimen notes
5. Reduction devices
6. Heading and Subordinate points

B-4 REPORT WRITING
1. Reporting Events
2. Reporting Interviews

UNIT-IV

B-5 APPLICATION: On given circumstances, Format of the application.

B-6 LETTER WRITING: Personal letters, Business letters, objectives, Introduction, Format of the latter, How to write effective letters.

UNIT-V

FUNCTIONAL GRAMMER: Grammar will be taught in a functional, integrated and informal way giving stress more on the usage rather than defining them Maximum possible exercises will be given.

CORRECT USAGE: Parts of speech, Agreement of the verb with the subject, Subject and predicate.

TRANSFORMATION OF SENTENCES: Interchange of Active and passive voice, Interchange of affirmative and negative sentences, Interchange of Explanative and assertive sentences, interchange of parts of Speech.

BOOK:
1. English Grammar by Wren & Martin
2. The Most Common Mistakes in English Usage the Addition by ThomsEllat.
BCA SECOND SEMESTER

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BCA-201: COMPUTER SYSTEM ARCHITECTURE

Max. Marks-70,
Min. Marks – 28

UNIT-I

DATA REPRESENTATION- Data types, Number Systems: Binary number system, Octal & Hexa–Decimal Number system. Fixed-Point Representation: Is & 2s complement, Binary fixed-point representation. Arithmetic operation on binary numbers, overflow & underflow.

UNIT-II

DIGITAL LOGIC CIRCUITS: Logic gates, AND, OR, NOT, GATE & their truth tables, NOR NAND & XOR gates. BOOLEAN ALGEBRA: Demorgan’s theorem. MAP STMPLOCATION: Minimization techniques, X, Map. Sum of product & product of sums. COMBINATIONAL & SEQUENTIAL CIRCUITS: Half address full address, full subtractor, Flip-Flops-RS, & T Flip-Flops, Shift registers RAM AND ROM.

UNIT-III

CPU ORGANTSATIONS- ALU & CONTROL CIRCUIT: Idea about arithmetic circuit program control, Instruction sequencing. INTRODUCTION TO MICROPROCESSOR: Microprocessor Architecture (3086), System buses, Register, program counter, Block diagram of a Micro Computer System. Microprocessor control signals, Interfacing devices. INTROCUCTION TO MOTHER BOARD: Idea about different cards and their functions, SMPS.

UNIT-IV

INPUT-OUTPUT ORHANTSATION: I/O interface, properties of Simple I/O Devices and their
controller, Isolated versus memory-mapped I/O, Modes of Data Transfer, Synchronous & Asynchronous Data Transfer Handshaking, Asynchronous serial transfer, I/O processor.

UNIT-V
MEMORY ORGANISATION: Auxiliary memory, Magnetic drum, Disk & Tape Semi conductor memories, Memory Hierarchy, Associative memory, Virtual memory, Address space & memory space, Address Mapping, Page table, Page replacement, Cache memory, Hit Ratio, Mapping techniques, Writing into cache.

TEXT BOOK:
Computer System Architecture by: M. MORRIES MANO

NOTE: There shall be ten question in the questions paper, two questions from each unit. The student will have to attempt five questions selecting one question from each unit.

BCA-202: INTERNET CONCEPTS AND WEB DESIGN

Max. Marks-70,
Min. Marks-28

UNIT I
Overview of Internet: Introduction to Internet and WWW, Growth of Internet, Owners of the Internet, Anatomy of Internet, ARPANET, Internet history, Concept of Networking, Brief introduction to Networking models (OSI,TCP/IP), Packet switching, Internet infrastructure, Internet working, Internet protocols and services like TCP/IP, http and WWW, telnet, FTP, Usenet and newsgroup, SMTP and Electronic mail, Internet address and its format URL, domain name, Internet Tools like Web Browsers, Search Engines, Chat & Bulletin Board Services.

UNIT II
Principles and planning of Web Design: Design for the medium: craft the look and feel, portable design, design for low band width, plan for clear presentation and easy access, Design the whole site: smooth transition, grids for visual structure, active white space, Design for the user: design for interaction, location, flat hierarchy, power of hypertext linking, content decision, Design for the screen, Planning the site : site specification, identity and content goal, analyzing audience, building website development team, filename and URLs, Directory structure, diagram the site.

UNIT III
Introduction to HTML: Introduction to HTML, Elements of HTML syntax, Head and Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and Color Control, meta tags, ordered and unordered lists, Table Handling: Table layout & presentation, constructing tables in a web page, Frames: Developing Web pages using frames. Forms and its elements, special tags like COLGROUP,THEAD,TBODY, TFOOT,IFRAME,LABEL etc.

UNIT IV
Introduction to JAVASCRIPT: JavaScript variables and data types, statement and operators, control structure object-oriented programming: Functions, Executing deferred scripts, objects, Messaging in a
JavaScript: dialog boxes, Alert boxes, confirm boxes, prompt boxes, JavaScript with HTML, Events, Events Handlers, Forms, Forms array.

UNIT V
Site Navigation and Publishing of Website: Creating usable navigation, Using text based navigation: Linking with text based navigation bar, linking to individual files, linking to document/external document fragments, contextual linking. Using graphics based navigation: using text image for navigation, using icon for navigation. Website Publishing: choosing an internet service provider, buying a domain name, using FTP to upload files, Website testing: testing consideration, user testing, feedback form. Refining and updating contents, working with search engines submitting URLs to search engines.

TEXT BOOKS:
2. Thomas A. Powell: HTML complete Reference, TMH

REFERENCE BOOKS:
1. The Complete Reference Web Design, Thomas A. Powell
2. Internet and Web Design, Vikas Gupta, DreamTech.

BCA-203: OOPS AND PROGRAMMING in C ++

Max. Marks-70,  
Min. Marks - 28

UNIT-I

UNIT-II
TOKENS EXPRESSIONS AND CONTROL STRUCTURES: Introduction, Tokens, Keywords, Identifiers Basis Data Types, User Defined Data Types, Derived Data Types Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of V Variable, Dynamic Initialization of Variables, Reference Variables, Operators Memory Management Operators, Manipulators, Type Cast Operator, Expressions and Implicit Conversions, Operator, Overloading, Control Structures. FUNCTION ++ : The Main Function Prototyping, Call by Reference, Return by reference, Inline Functions, Default Arguments, const Arguments, Function Overloading, Friend and Virtual Functions.

UNIT-III
CLASSES AND OBJECTS : ‘C’ Structures Revisited, Specifying A class, Defining Member Functions, A C++ Program with class, making An Outside Function. Inline, Nesting of member Functions, Private member Functions, Arrays A class, Memory Allocation for Objects, Static Data Members, static Member functions, Arrays of Objects As Function Arguments.
UNIT –IV
CONSTRUCTORS AND DESTRUCTORS: Introduction, Constructors, Parameterized Constructors, Multiple Constructors in a class with default Arguments, Dynamic Initialization of Objects, Copy Constructor, Constructors, Constructing, Two-Dimensional Arrays, Destructors.

UNIT –V
POINTER VIRTUAL FUNCTIONS AND POLYMORPHISM: Introduction, Pointers Operations, to objects, This pointer, Pointers to derived classes, virtual functions, pure Virtual Functions, Managing Console I/O Operations, C++ Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted console I/O Managing Output with manipulators.

BOOKS:
1. OBJECT-ORIENTED PROGRAMMING WITH C++ By E. BALAGURUSAMY
2. OBJECT-ORIENTED PROGRAMMING WITH C++ By NABAJYOTI BABKAKATI SAMS PHI. PVT.LTD.
3. Object Oriented Prog. With ANSI & Turbo C++ by Ashok N. Kamthane (Pearson Education)
4. Insight into OOP & C++ by Ekta Gupta (Pragya Publication, Hindi Medium)

Note: There shall be Ten Questions in the question paper, Two questions from each unit. The student will have to Attempt five question, Selecting one question from each unit

BCA-204: DATA BASE MANAGEMENT SYSTEM

Max. Marks-70,
Min. Marks - 28

UNIT-I

UNIT-II
RELATIONAL DATA STRUCTURE: Relations Domains Attributes, Keys Extensions and Intentions, Base Tables, Indexes, System R Data Manipulation, Retrieval, Operations Built-In-Functions, Update Operations, the System R Dictionary.

UNIT-III
UNIT-IV

RELATIONAL DATABASE DESIGN: Relational Algebra, Traditional Set Operations, Attribute Name for Derived Relations, Special Relational Operations, Relational Calculus, Type-Oriented Relational Calculus, Further Normalization. Functional Dependence, First, Second and Third Normal Forms, Relations with More than One Candidate Key, Good and Bad Decompositions, Fourth Normal form Fifth Normal Form.

UNIT-V

THE HIERARCHICAL APPROACH: The Architecture of An 'IMS System, Background, Architecture, IMS Data Structure, Physical Database, The Database Description, Hierarchical Sequence, IMS Data Manipulation, Defining the program communication Block (PCB). The LL/I Examples, Constructing the Segment search Argument, using more than one PCB.


BOOKS:

1. AN INTRODUCTION TO DATABASE SYSTEM (3rd ED.) By : C.J.DATE.
2. DATABASE SYSTEMN CONCEPTS (2nd ED.) By : C.J. DATE.
3. AN INTRODUCTION TO DATABASE SYSTEM By : BIPIN C. DESAI.

Note: There Shall be Ten Questions in the question paper, Two questions from each unit. The student will have to Attempt five question, Selecting one question from each unit.

BCA-205: SYSTEM ANALYSIS & DESIGN AND MIS

Max. Marks-70, Min. Marks - 28

UNIT-I


UNIT-II

UNIT-III

UNIT-IV
Management Information System: Introduction, what is MIS, characteristics of an MIS, the primary function, the MIS through the organization, a system of users and machine, Reporting capabilities-Principles of reporting’. Summarization of information, Report presentation mode, Types of Reports, Need for an MIS – Pitfalls in designing an MIS, Designing an effective MIS-Data Banks/Bases, determinants of value of information, Uses of Information- Users of Information within the organization, Users of information, Outside the Organization Function Reporting System, Characteristics of information flow.

UNIT-V

TEXT BOOKS:
3. A. Mansoor, System analysis & Design, Pragya Publication (Hindi Medium)

REFERENCE BOOKS:

Note: There Shall be Ten Questions in the question paper, Two questions from each unit. The student will have to Attempt five question, Selecting one question from each unit.
BCA THIRD SEMESTER

BCA-III SEM

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Total Marks 600

Minimum Passing marks in Theory : 40 % and Practical : 50%

BCA-301: CYBER SECURITY

Max. Marks-70
Min. Marks - 28

UNIT-I


UNIT-II


UNIT-III

Cryptography, Cryptographic mechanisms, Digital signatures, Encryption, Certificates Lattice and reference monitors, Security levels and categories, Lattice diagram, Reference monitors, Security kernel, Hardware security features, Protecting memory
UNIT-IV

Security models, Chinese wall model, Bell-La Padula, Biba, Non-deducibility, Non-interference, Other models, Network security, Protocol design principles, ISO architecture, IP security, SSL/TLS, Firewalls, Intrusion detection

UNIT-V

Unix security and Windows security, Subjects, objects and access control software security and database security, Memory management, Data and code, Relational databases Access control in databases, Statistical database security, General security principles, Access components, Access decisions, Administration and management issues

REFERENCES:

   Author: Dieter Gollmann
   Publisher: John Wiley & Sons, 2006
   ISBN: 0-470-86293-9

   Author: Charles P. Pfleeger, Shari Lawrence
   Publisher: Pearson India

3. Cryptography and Network Security
   Author: William Stallings
   Pearson Education

BCA-302: DATA STRUCTURE & ALGORITHMS

UNIT-I

INTRODUCTION TO DATA STRUCTURE: The concept of Data structure, Abstract Data structure. Analysis of Algorithm, The concept of List. STACKS AND QUEUES: Introduction to stacks & primitive operations on stack, Stack as an abstract Data type, Multiple stack, Stacks Applications: Infix, Post Fix, prefix and recursion, Introduction to queues, primitive operation on the queues, Queue as abstract Data type, Circular queue, Dequeue, Priority queue.

UNIT-II

LINKED LIST: Introduction to the linked list of stacks, The linked list of queue, Header nodes, Doubly linked list, Circular linked list, Stacks and queues as a circular linked list, Application of linked list.

UNIT-III
TREES: Basic terminology, Binary trees, Tree representations as array & linked list Binary tree representations, Traversal of binary trees; in order, Preorder & Post order, Application of binary trees. Threaded binary tree. B-tree & Height balanced tree, Binary tree representation of trees, Counting binary trees.

UNIT-IV
SEARCHING SORTING: Searching, Binary Searching, Insertion sort Selection. Quick Sort, Bubble sort, Heap Sort, Comparison of sorting methods.

UNIT-V
TABLES & GRAPHS: Hash table, Collision resolution techniques, Introduction to graph definition, Terminology, Directed undirected & weighted graph, Representation of graphs, Graph traversals: Depth first & Breadth first search, Spanning trees, Minimum spanning tree Application of graphs.

TEXT BOOKS:
1. FUNDAMENTAL OF DATA STRUCTURE: By S. Shahney & E. Horowitch
2. DATA STRUCTURE: By Trembly & Sorrenson.
3. DATA STRUCTURE USING: PASCAL: By Trannenbaum & Augensteiner.
4. DATA STRUCTURE: By Lipschutters
   (Scheme’s Outline Series McGraw Hill Publication)
5. Introduction to Data Structure by Shridhar B. Dandin – Pragya Publication (Hindi Medium)

NOTE: There shall be ten question in the questions paper, two questions from each unit. The student will have to attempt five questions selecting one question from each unit.

BCA-303: MATHEMATICAL FOUNDATION

Max. Marks-70,
Min. Marks - 28

UNIT-I

UNIT-II
UNIT-III


UNIT-IV

ELEMENTARY INTEGRATION : Sequence and Series. Arithmetic progression (A. P.), arithmetic mean (A.M.), Geometric progression (G.P.), general term of a G.P sum of n terms of a G.P., geometric mean (G.M.), relation between A.M. and G.M. Sum to n terms of the special series Σn, Σn² and Σn³.

UNIT-V

Graph Theory: Definition and type of Graphs, Incidences and degree of vertices, Isomorphism of graphs, connected and disconnected graphs, walks, paths and circuits. Directed graph, tree centre of tree, Binary Tree elementary results (properties or theorems) of graphs, connected graphs and trees (without proof).

BOOKS:

2. A Text books of Elementary calculus By D.C. Agrawal, Thakur & Harikishan.
3. A Text Book of Vector Calculus & Geometry By D.C. Agrawal.
5. Calculus : By Thakur & Harikishan.

Note: The shall be ten question in the question paper two question from each unit. The students will have to attempt five question, selecting one questions from each unit.
BCA-304: RDBMS (ORACLE)

UNIT-I
Oracle product details, Overview of oracle architecture Oracle files, System and User process, OracleMemory, System data base object, Oracle Data types.

UNIT-II
Working with Tables. Data Constraints, Select Command, Oracle Operator, Range Searching, Pattern Matching, Oracle Built In Function Grouping data from Tables in SQL, Manipulation Data in SQL, Joining Multiple Tables ,Sub queries.

UNIT-III

UNIT-IV
PL/SQL Introduction, Data type support in PL/SQL, Conditional Statements, Using DML Within PL/SQL, Procedures & Functions, Cursors, Parameterized Cursor.

UNIT-V
Exception handling in PL/SQL, Triggers - Concept, use, how to apply database triggers, type of triggers, Syntax, deleting.

TEXT & REFERENCE BOOKS:
• IVAN BAYPOS.C, 'SQL. PL/SQL", BPB PUBLICATIONS"
• LIEBSCHUTY. 'THE ORACLE COOKBOOK", BPB PUBLICATION
• MICHAEL ABBEY, MICHAEL JCOREY, 'ORACLE A BEGINNERS GUIDE". TMHPUBLICATION
• ORACL DATA BASE 11 G SATISH ASNANI PHI LEARNING
<table>
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Minimum Passing marks in Theory : 40% and Practical : 50%

**BCA-401:  PROGRAMMING IN VB.NET**

Max. Marks-70, Min. Marks - 28

UNIT-I

The Environment: Editor Tab, Format Tab, General Tab, Docking Tab, Visual Development & event Driven Programming- Methods and Events.

UNIT-II

The VB.Net Language-Variables, Declaring Variables, Data type of Variables, Variables Declaration, Scope & Life Time of a variables, Constant, Arrays, Types of Arrays, Control Array, Collections, Subroutines, Functions, Passing variable number of Argument, Optional Argument, Returning value from functions.
Control Flow statements: Conditional statement, Loop statement, MSGBOX & Input Box.

UNIT-III

Working with Forms: Loading, showing and hiding forms, Controlling One from within another.
GUI Programming with Windows Form: Text Box, Label, Button, List Box, Combo Box, Checkbox, Picture box, Radio Button, Panel, Scroll bar, Timer, List view, Tree view, Tool bar, Status Bar properties, Methods and Events, Open File Dialog, Save FileDialog, FontDialog, Color Dialog, Print Dialog, Link Label.
UNIT-IV
Object Oriented Programming, Classes and Objects, Fields Properties, Methods and Events, Constructor, Inheritance, Access Specified: Public, Private, Protected, Overloading, My Base & My Class Keywords. Overview of OLE, Accessing the WIN32 API from VB.Net, CO Methodology, advantage of COM+, COM & .Net, Create User Control, Register user Control, Access com components in .net application.

UNIT-V
Database programming with ADO.Net-Overview of ADO, from ADO to ADO.Net, Accessing Data using Server Explorer, Creating Connections, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound, Display data on data grid.

TEXT & REFERENCE BOOKS:
1. VB.net Programming Black Box by Steven Holzner- Dreamtech Publication
4. MSDN.MiroSoft.Com/Net
5. WWW.Gotdotnet.Com
6. VB.Net Programming , Pragya Publication (Hindi Medium)

BCA-402: THEORY OF OPERATING SYSTEM
Max. Marks-70,
Min. Marks - 28

UNIT-I

UNIT-II

UNIT-III

UNIT-IV
STORAGE MANAGEMENT :  Background, Logical Versus Physical Address Space, Swapping, Contiguous Allocation Paging Segmentation, Segmentation with Paging Virtual Memory, Demand Paging Performance of Demand Paging Page Replacement, Page- Replacements Algorithms, Allocation
UNIT-V


I/O SYSTEMS: Overview, I/O Hardware, Application I/O Interface I/O Subsystem, Transforming I/O Requests to Hardware Operations, Performance, Disk Structure, Disk Scheduling, Swap-Space Management, Disk Reliability, Stable-Storage Implementation.

TEXT & REFERENCE BOOKS:

1. OPERATING SYSTEM CONCEPTS By SILBERCHATZ & GALVIN.
2. Operating System By Gaurav Sharma (Pragya Publication - Hindi Medium)

Note: There Shall be Ten Questions in the question paper, Two questions from each unit. The student will have to Attempt five question, Selecting one question from each unit.

BCC-403 SOFTWARE ENGINEERING

Max. Marks 70
Min. Marks 28

UNIT-I

UNIT-II
Planning Software Project:- Cost estimation, uncertainties in cost estimation, building cost estimation models, on size estimation, COCOMO model, project scheduling, average duration estimation, project scheduling and milestones, staffing and personnel planning, rayleigh curve, personnel plan, team structure, software configuration management plans, quality assurance plans, verification and validation, project monitoring plans, risk management.
UNIT-III

Function Oriented Design:- Design principles, coupling, cohesion, design notation and specification, structured design methodology, verification, network metrics, stability metrics, information flow metrics Software Testing.

UNIT-IV

Testing Methods: Software testing fundamentals, test case design, white box testing, control structure testing, black-box testing, testing for specialized environments. Software Testing Strategies: A Strategic Approach to software testing, strategic issues, unit testing, validation testing, system testing, the art of debugging.

UNIT-V

Re-Engineering: Software re-engineering, software maintenance, a software reengineering process model, reverse engineering, reverse engineering user interfaces, restructuring, code restructuring, data restructuring, forward engineering the economics of reengineering. Client/Server software Engineering: The structure of client/server systems, software engineering for c/s systems, analysis modeling issues, design for C/S systems, testing issues. Computer-Aided software Engineering: What is case, building blocks for case, a taxonomy of case tools, integrated case environments, the integration architecture, the case repository.

TEXT BOOKS:


REFERENCE BOOKS:

2. Poyce, Software Project Management, Addison-Wesly.
BCA-404: NUMERICAL METHODS & ANALYSIS

Max. Marks-70,
Min. Marks - 28

UNIT-I
COMPUTER ARITHMETIC: Binary number system. Octal & Hexadecimal system, Floating point Arithmetic, Transcendental and polynomial equations, Direct & Indirect methods, fixed point Iteration methods, Regularafalist method.

UNIT-II

UNIT-III
SYSTEM OF LINEAR ALGEBRIC EQUATIONS: GrammarRule (Lu) Decomposition of Matrix, Gauss Elimination methods, Consistent and inconsistent, System of equations Jacobi iteration method, Gauss seidel iteration method index of convergence.

UNIT-IV
INTRODUCTION AND APPROXIMATION: Newton Interpolation formula and Newton Backward interpolation formula, Error in Newton interpolation formula, Lagrange interpolation formula Newton’s divided difference interpolation formula.

UNIT-V
NUMERICAL DIFFERENTIATION AND INTERGRATION: Methods based on interpolation methods based on finite differences operators Newton colts. Method Trapezoidel rule and Simpson’s rule.

BOOKS :
2. NUMERICAL ALGORITHMS BY E.V. KRISHNAMURTHY and S.K.SEN EAST-WEST PARES Ltd. 1986.
3. DISCRETE MATHEMATICS – D.C. AGARWAL, H.K. PATHAK. 1986

NOTE : There shall be ten question in the questions paper, two questions from each unit. The student will have to attempt five questions selecting one question from each unit.
BCA-501: COMPUTER NETWORKS

UNIT-I
Needs and Advantages – Network, Types-server based, peer, Hybrid Server Types Network Topology – Bus, Star, Ring, Star bus, Star ring, Mesh, Network Protocols Hardware protocol, Software protocols, Selecting and designing the network for an organization.

UNIT-II
Signal Transmission-Digital signaling, Analog. Signaling Bit synchronization, Baseboard and Broadband transmission, Network Media types – properties & specialties, comparative study, Network adapters working principals configuration and selection.

UNIT-III
OSI, IEEE 802 AND TCP/IP model, Comparison between CSI & TCP/IP, Ethernet working principal, 10 & 100 MBPS Ethernet, Token Ring-working principal, cabling, Hubs, FDDI, Apple talk & ARC networking and their components, Network Scaling- No of computers, distance, software, speed Special Acquirements.

UNIT-IV
Networking Technologies – Fiber Channel, ATM, Network connectivity – Hubs, reprinters, Bridges, Multiplexers, Internet connectivity – Routers and Routers, gateways, CSUs/DSUs.

UNIT-V
Various Sever & Clients Hardware & Software. Overview of Internet: Internet & TCP/IP, Internet addressing, Concepts of ISP, Concept of URL addresses, Hypertext Concepts & WWW,FTP,NNTP, Email, SMTP. Internet security: Internet security issues, Embedded & software based firewall, Data Encryption Digital Signatures.

TEXT BOOKS:

REFERENCE BOOKS:
BCA-502  PROGRAMMING IN JAVA

UNIT-I

JAVA EVOLUTION: Java History, Java features. How Java differs from C and C++ Java and internet, Java and World Wide Web. Hardware and software requirements, Java support systems Java environment.

OVERVIEW OF JAVA LANGUAGE: Introduction, Simple Java program, Memory Java in application with two classes, Java program structure, Java statements, Implementing a Java program, Java virtual machine, Command Line arguments, Programming style, Constants & Variables, Data types, Declaration of variables, Giving values to variables. Scope of variable, Symbolic constants, type casting getting values of variables, standard default values, Arithmetic operators, relational operators, Logical operators, Assignment operators, Increment and decrement operators, Conditional operators. Bitwise operators, Special operators, Arithmetic Expressions.Evaluation of expressions.Precedence of arithmetic operators.Type conversations in expiation. Operators Precedence and Associatively, mathematical functions.

UNIT-II


UNIT-III

CLASSES OBJECTS AND METHODS: Defining a class, adding variable and methods, creating objects, Accessing class members, Constructors, Methods overloading, Static members, Nesting of methods, inheritance extending a class, overriding methods, Final Classes, Finalizer methods, Abstract methods and classes, Visibility control.

ARRAYS STRAINS AND VECTORS: Array one dimensional arrays, Creating an array, Two dimensional arrays, strings, Vectors, wrapper classes, Defining interfaces. Extending interfaces. Implementing interfaces, Accessing interfaces variables, System packages, Using system package, Naming conventions, creating packages, Accessing package, Using a package, Adding a class to a package, Hiding classes.

UNIT-IV

MULTITHREAD PROGRAMMING: Creating threads, Extending the thread class, stopping and blocking a thread, life cycle of a thread. Using thread Methods. Thread exception, Thread priority, Synchronization, Implementing the runnable interface.

UNIT-V

APPLET PROGRAMMING: Local and remote applets, How applets differ form applications, preparing to write Applets, Building, applet code, applet life cycle, Creating an Executable applet, Designing a wet page, Applets tag. Adding applets to HTML File, Running the applet, More about applets tags, passing parameters to applets, Aligning the display, More about HTML tags, Displaying Numerical values, Setting input from the User.
BOOKS:
1. Programming With Java A primer By : E. Balagruswamy.
2. Peter Nortons Guide To Java Programming By :Techmedia Publication.

NOTE: There shall be ten question in the questions paper, two questions from each unit. The student will have to attempt five questions selecting one question from each unit.

BCA-503: DATA MINING

Max. Marks-70,
Min. Marks - 28

UNIT-I
Introduction to Data Mining: Basic concepts in data mining, data measurement, exploratory data analysis, data visualization, Basic Principles of Data Mining: predictive modelling: classification and regression, model fitting as optimization, evaluation of predictive performance, overfitting, regularization Other data mining tasks: clustering and pattern detection

UNIT-II
Text Mining: information retrieval and search, text classification, unsupervised learning. Recommender Systems: recommender data, Netflix prize data, nearest neighbor algorithms, matrix decomposition algorithms, efficient algorithms for large data sets, modeling systematic effects

UNIT-III
Web Data Analysis: Web data: collection and interpretation, analyzing user browsing behaviour, learning from click through data, predictive modeling and online advertising, link analysis and the Page Rank algorithm

UNIT-IV
Social Network Analysis: descriptive analysis of social networks, network embedding and latent space models, network data over time: dynamics and event-based networks, link prediction.

UNIT-V
Neural networks, learning curves, and performance optimization: Simple neural networks, Multilayer Perceptrons, Learning curves, Meta-learners for performance optimization, ARFF and XRFF.

TEXT BOOKS:
1. Introduction to Data Mining: By Pang-Ning Tan, Michael Steinbach, Vipin Kumar
2. Data Mining Concept and Technique: By Jiawei Han, Jian Pei.
BCA-504: PROGRAMMING WITH ASP.NET

Max. Marks-70, Min. Marks - 28

UNIT-I
HTML – CONCEPT Of Hypertext, Versions of HTML, elements of HTML, Head & Body Sections, Building of HTML documents, Inserting text, Images, Hyperlinks, Background & Colour controls, Different HTML tags, Table layout and presentation, Use of font size and attributes. List types and its tags, Use of Frames and Forms in web pages, ASP & html FORMS.

UNIT-II
Overview of Dynamic web pages, Introduction & features of ASP.NET, Understanding ASP.NET Controls, Applications, Web Servers, Installation of IIS. Web forms, Web form controls-server controls, client controls. Adding controls to a web form, Buttons, Text box, Labels, Check box, Radio Buttons, List box, Adding controls at run time, Running a web application, Creating a multiform web project. Form Validation: Client side validation, server side validation, Validation Control: Required Field Comparison Range, Calendar Control, Ad rotator Control, Internet Explorer Control.

UNIT-III
Overview of ADO.NET, from ADO to ADO.NET, ADO.NET Architecture, Accessing Data using Data Adapter and Datasets, using command and data reader, binding data to data bind controls, displaying data in data grid. XML in .NET, XML basics, attributes, fundamental XML classes, Document, text writer, text reader, XML Validations, XML in ADO.NET, The XML Data Document.

UNIT-IV

UNIT-V
Overview of C# and .NET, similarities and differences from JAVA, Structure of C# program. Language features: Type system, boxing and unboxing, flow controls, classes, interfaces, Serializations and Persistence, Serializing an object, Desterilizing an object. Delegates, Reflection.

TEXTBOOKS:-

1. The Complete Reference ASP.NET By Mathew Macdonald-TMH.
3. VB.NET Programming Black Box by Steven Holzer- Dreamtech Publication.
4. Introduction to .NET framework – Wrox publication.
5. ASP.NET Unleased.
6. C# programming- Wrox Publication
7. C# programming Black Box by Matt telles- Dreamtech Publication.
8. Learn HTML in a weekend by Steven E Callihan PHI.
9. using HTML by Lee Anne Phillips PHI.
10. Learn ASP.NET- Prayga Publications (Hindi Medium)
## BCA SIXTH SEMESTER

### BCA-VI SEM

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Minimum Passing marks in Theory : 40 % and Practical : 50%

### BCA-601: PHP and MySQL

Max. Marks-70  
Min. Marks – 28

**UNIT-I**

**Introduction to PHP:** History of PHP, Versions of PHP, Features of PHP, Advantages of PHP over Other Scripting Languages, Installation and Configuration of PHP, Data Types in PHP, PHP Syntax, Comments, PHP Variables and Constants, Scope of Variables, PHP String, String Manipulation, PHP Operators, Precedence of Operators, Expressions, Creating a PHP Script, Running a PHP Script.

**UNIT-II**

**Basic HTML** Embedding PHP in HTML, Passing Information between Pages, PHP $_GET, PHP $_POST, PHP Conditional Statements, PHP Looping Statements, Break, Continue, Exit, **PHP Functions:** Built-in and User Defined Function, Regular Expression Functions, Mathematical, Date and Time Functions,  
**PHP Arrays:** Creating Array and Accessing Array Elements,  

**UNIT-III**

**PHP File Permissions, Working with Files:** Opening, Closing, Reading, Writing a File; **Working with Directory:** Creating, Deleting, Changing a Directory;  
**Working with Forms:** Introduction to a Web Form, Processing a Web Form, Validating a Web Form, Input Validation, PHP with Client Side Scripting Language, Exception and Error Handling in PHP, Introduction to Cookies and Session Handling,  

**UNIT-IV**

**Working with Database:** PHP-Supported Databases;  
**Using PHP & My SQL:** Installation and Configuration of My SQL on Windows, Checking Configuration, Connecting to Database, Selecting a Database, Adding Table and Altering Table in a Database, Inserting, Deleting and Modifying Data in a Table, Retrieving Data, Performing Queries, Processing Result Sets,
UNIT-V
Code Re-use, require(), include(), and the include path, File System Functions and File Input and Output, File Uploads, Use of CSS, Introduction to Object Oriented Programming with PHP, Installing and Configuring Apache to use PHP on Windows, php.ini File,

TEXT & REFERENCE BOOKS:
1. PHP & MYSQL, BY VIKRAM VASWANI, TMH PUBLICATIONS
2. PHP ESSENTIALS, BY JULIE C. MELONI, BPB PUBLICATIONS
3. PHP 5 AND MYSQL BIBLE, BY TIM CONVERSE AND JOYCE PARK, WILEY-DREAMTECH INDIA PUBLICATIONS
4. WEB TECHNOLOGIES, BLACK BOOK, DREAMTECH PRESS
5. ATKINSON, LEON. CORE PHP PROGRAMMING, NEW YORK: PRENTICE HALL
6. LEARNING PHP 5, BY DAVID SKLAR PUBLISHER O'REILLY MEDIA
7. MASTERING PHP, BY CHARLES, PUBLISHER: BPB
8. EXPERT PHP AND MYSQL, WROX PROGRAMMER TO PROGRAMMER, WROX PRESS, 2010
9. PHP FOR ABSOLUTE BEGINNERS, APRESS, 2009
10. SAMS TEACH YOURSELF CSS IN 24 HOURS (2ND EDITION), SAMS PUBLISHING, 2006

BCA-602 CLOUD COMPUTING

Max. Marks-70,
Min. Marks - 28

UNIT-I


UNIT-II


UNIT-III

Cloud Management & Virtualization Technology: Resiliency, Provisioning, Asset management, Concepts of Map reduce, Cloud Governance, High Availability and Disaster Recovery. Virtualization: Fundamental Concepts of Compute, storage, networking, desktop and Application Virtualization, Virtualization benefits, server Virtualization, Block and file level storage virtualization Hypervisor Management software, Infrastructure Requirements, Virtual LAN(VLAN) and Virtual SAN(VSAN) and their Benefits.

UNIT-IV

Market Based Management of Clouds, Federated Clouds/Inter Cloud: Characterization & Definition, Cloud Federation Stack, Third party Cloud Services. Case Study: Google App Engine, Microsoft Azure, Hadoop, Amazon, Aneka

List of Experiments:

1. Installation and configuration of Hadoop/Euceliptus etc.
2. Service deployment & usage over cloud.
3. Management of cloud resources.
4. Using existing cloud characteristics & services models.
5. Cloud Security Management
6. Performance evaluation of services over cloud. Grading System 2013-14

Recommended Text: