



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL
SCHEME FOR
BACHELOR OF COMPUTER APPLICATIONS (BCA)
(Effective From July 2015-16 Session)

SEMESTER -I

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
1BCA1	Fundamentals of Computers & Information Technology	4			80	20		100
1BCA2	Programming Methodology and C Programming	4	1	3	80	20	25	125
1BCA3	PC Packages (Word, Excel and PowerPoint)	4		3	80	20	25	125
1BCA4	Mathematics-I	4	1		80	20		100
1BCA5	Communicative English-I	4			80	20		100
Semester Total								550

(*L – Lecture, T – Tutorial, P – Practical)

SEMESTER -II

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
2BCA1	Digital Electronics	4			80	20		100
2BCA2	Data Base Management System	4	1	3	80	20		100
2BCA3	Advanced Programming in C	4		3	80	20	25	125
2BCA4	Desk Top Publishing &	4	1		80	20	25	125
2BCA5	Operating System Concepts	4			80	20		100
Semester Total								550

General Instructions:

1. For passing the subject examination minimum 33% marks must be separately scored in Theory Paper, Practical Exams and Internal Evaluation in the subject.
2. For passing the semester, minimum aggregate marks must be 33% in the semester.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Sub Code: 1BCA1

Subject Name: Fundamentals of Computers and Information Technology

<p>UNIT- I Brief History of Development of Computers, Computer System Concepts, Computer System Characteristics, Capabilities and Limitations, Types of Computers, Basic Components of a Computer System - Control Unit, ALU, Input/output Functions and Characteristics, Memory RAM, ROM, EPROM, PROM and other types of Memory.</p>
<p>UNIT- II Input/ Output & Storage Units - Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Barcode Reader, Voice Recognition, Light pen, Touch Screen, Monitors - Characteristics and types of monitor , Size, Resolution, Refresh, Dot Pitch, Video Standard - VGA, SVGA, XGA.</p>
<p>UNIT - III Printers and its Types - Dot Matrix, Inkjet, Laser, Plotter, Sound Card and Speakers, Storage Fundamentals - Primary Vs Secondary data Storage, Various Storage Devices - Hard Disk Drives, Floppy Disks ,Optical Disks, Flash Drives.</p>
<p>UNIT- IV Use of Communication and IT, Communication Process, Communication Types- Simplex, Half Duplex, Full Duplex, Serial and Parallel Communication, Types of Network - LAN, WAN, MAN , Internet, Topologies of LAN - Ring, Bus, Star, Mesh and Tree Topologies, World Wide Web and its Applications and Internet Services.</p>
<p>UNIT - V Software and its Need, Types of Software - System Software, Application Software, System Software - Operating System, Utility Program, Programming Languages, Assemblers, Compilers and Interpreter, Programming Languages- Machine, Assembly, High Level, 4GL.</p>
<p>TEXT & REFERENCE BOOKS:</p> <ul style="list-style-type: none">• <i>COMPUTERS TODAY, BY S.K BASANDRA, GALGOTIA PUBLICATIONS.</i>• <i>FUNDAMENTALS OF INFORMATION TECHNOLOGY ALEXIS LEON & MATHEWS LEON, , VIKAS PUBLISHING</i>• <i>DOS QUICK REFERENCE RAJEEV MA THUR, , GALGOTIA PUBLICATIONS</i>



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Sub Code: 1BCA2 Subject Name: Programming Methodology and C Programming

UNIT - I

Program Concept, Characteristics of Programming, Various Stages in Program Development, Algorithms, Flow Charts, Programming Techniques – Top Down, Bottom Up, Modular, Structured, Features, Merits, Demerits and Their Comparative Study. Programming Logic - Simple, Branching, Looping, Recursion, Programming Testing & Debugging.

UNIT- II

Introduction to C Language, C Language Standards, Features of C, Structure of C Program, Introduction to C Compilers, Creating and Compiling C Programs, IDE, Features of Turbo C Compiler. Keywords, Identifiers, Variables, Constants, Scope and Life of Variables, Local and Global Variable, Data Types, Expressions. Operators - Arithmetic, Logical, Relational, Conditional and Bit Wise Operators, Precedence and Associativity of Operators, Type Conversion. & Character Functions.

UNIT- III

Basic Input/output Library Functions ,Character Input/output getch(), getchar(). getche(), putchar(). Formatted Input/Output - printf() and scanf(), Mathematical Declaration Statement, Conditional Statement - if Statement, if else Statement, Nesting of if... .else Statement, else if Ladder, The ?: Operator, switch Statement. Iteration Statements - for Loop, while Loop, do-while Loop. Jump Statements: break, continue, goto, exit().

UNIT – IV

Arrays - Concept of Single and Multi Dimensional Arrays Strings : Declaration, Initialization, Functions Line Arguments, Storage Class Specifier - Auto, Extern, Static, Register.

UNIT - V

The Need of C Functions, User Defined and Library Function, Prototype of Functions, Prototype of main() Function, Calling of Functions, Function Arguments, Argument Passing: Call By Value and Call By Reference, Return Values. Nesting of Function, Recursion, Array as Function Argument,

TEXT & REFERENCE BOOKS:

- *BALAGURUSWAMY, "PROGRAMMING IN C ", TMH PUBLICATIONS*
- *GOTTFRIED SCHAUMS OUTLINE SERIES, "PROGRAMMING WITH C ", TMH PUBLICATIONS*
- *MAHAPATRA, " THINKING IN C ", (PHI)PUBLICATIONS*
- *ANURAG SEETHA, "INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY", RAIN PRASAD & SONS, BHOPAL*
- *S.K. BASANDRA, "COMPUTERS TODAY", GALGOTIA PUBLICATIONS.*
- *PETER JULIFF "PROGRAM DESIGN" PHI PUBLICATIONS*



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Sub Code: 1BCA3

Subject Name: PC PACKAGES (Word, Excel and PowerPoint)

UNIT- I

MS Windows: Introduction to MS Windows, Features of Windows, Various versions of Windows & its use, Working with Windows, My Computer & Recycle bin , Desktop, Icons and Windows Explorer, Screen description & working styles of Windows, Dialog Boxes & Toolbars, Working with Files & Folders, Operations on Files and Folders, Shortcuts & Auto starts, Accessories and Windows Settings, Using Control Panel- Setting common devices using control panel, creating users, internet settings, Start button & Program lists, Installing and Uninstalling new Hardware & Software program on your computer.

UNIT- II

Office Packages: Office activates and their software requirements, Word-processing, Spreadsheet, Presentation graphics, Database, introduction and comparison of various office suites like MS-Office, Lotus-Office, Star-Office, Open-Office, MS Word Basics- Features & area of use. Working with MS Word, Menus & Commands, Toolbars & Buttons, Shortcut Menus, Wizards & Templates, Creating a New Document, Different Page Views and layouts, Applying various Text Enhancements, Working with Styles, Text Attributes, Paragraph and Page Formatting, Text Editing using various features , Bullets, Numbering, Auto formatting, Printing & various print options

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, MA TUR A*



UNIT- I

. Sets, Subsets, Power sets, Complement, Union and Intersection, Demorgan's law Cartesian products, Relations, relational matrices, properties of relations, equivalence relation,

UNIT – II

. Functions ,Injection, Surjection and Bijective mapping, Composition of functions, the characteristic functions and Mathematical Induction

UNIT- III

Proposition & propositional functions, Logical connections Truth-values and Truth Table, the algebra of propositional functions-the algebra of truth values- Applications (switching circuits, Basic Computer Components).

UNIT- IV

Partial order set, Hasse diagrams, upper bounds, lower bounds, Maximal and minimal element, first and last element, Lattices, sub lattices, Isotonicity , distributive inequality, Lattice homomorphism, lattice isomorphism ,complete lattice ,complemented lattice distribution lattice

UNIT- V

Finite graphs, incidence and degree, isomorphism, sub graphs and union of graphs, connectedness, walk, paths, and circuits Eulerian graphs ,tree properties of trees, pendant vertices in tree, center of tree ,spanning trees and cut vertices, binary tree ,matrix representation of graph, incidence and adjacency matrix and their properties, applications of graphs in computer science.

TEXT & REFERENCE BOOKS:

1. *J.P.Trembley & R.P.Manohar "Discrete Mathematical Structure with applications to Computer Science"*.
2. *Kenneth H. Rosen-203 "Discrete Math & its Applications" 5th ed.*
3. *K.A. Ross and C.R.B. Wriht "Discrete Mathematics "*.
4. *Bernard Kolman & Robert C. Busby "Discrete Mathematical Structures for Computer Science"*



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Sub Code: IBCA 5

Subject Name: Communicative English -1

UNIT-I

Sentences : Simple, Compound, Complex, Assertive, Interrogative, Imperative, Exclamatory. Clauses : Co-ordinate, Sub-ordinate, Relative, Adverb, Comparative (Adverb + Adjective) Articles: usage of 'A', 'An', 'THE' Preposition: Position of Prepositions, Place Relations Time Relations and other relations.

UNIT-II

Functional Grammar Tenses : Simple Present, Progressive Perfect, Present Perfect Progressive along with Past Tense and indications of futurity. Reported speech Modals : Will, Shall Should, Would and others Voice - Active and Passive.

UNIT-III

Reading & Writing, Comprehension of Unseen Passage , Grasp Of General Language Skills, Issues with Reference Words & Usage Within Passages.

UNIT-IV

Paragraph Writing, Expansion of given ideas, Listening, Note taking/Note making.

UNIT-V

Vocabulary : making sentences with idioms & phrases, Words Commonly Misspelled/confused, Words formation by prefix suffix.

TEXT & REFERENCE BOOKS:

- *A PRACTICAL ENGLISH GRAMMAR BY THOMSON AND MARTINET*
- *ENGLISH GRAMMAR BY W.S.ALLEN*
- *INTERMEDIATE ENGLISH GRAMMAR BY RAYMOND WILLIAMS*
- *VOCABULARY BY MICHAEL MC CARTHY AND FELICITY O'DELL*
- *ENGLISH GRAMMER BY JAYANTHI DAKSHINA MURTH*



UNIT-I

Data representation Data Types and Number Systems, Binary Number System, Octal & Hexa-Decimal Number System, Fixed Point Representation, 1's & 2's Complement, Binary, Arithmetic Operation on Binary Numbers, Overflow & Underflow, Floating Point Representation, Codes, ASCII, EBCDIC Codes, Gray Code, Excess-3 & BCD, Error Detection & Correcting Codes Binary Storage and Registers.

UNIT-II

Boolean algebra and digital logic circuits -Logic Gates, AND, OR, NOT,, NOR, NAND & XOR Gates and their Truth Tables, Boolean Algebra, Basic Definition and Properties, Basic Boolean Law's, Demorgan's Theorem, Minimization Techniques, K Map – Two, Three and More Variables maps, Sum of Product & Product of Sums, Don't care conditions.

UNIT-III

Combination Circuits - Half adder & Full adder, Full Subtractor, Full Subtractor and decimal adder, Code Conversion, Multilevel NAND and NOR Circuits, Decimal adder, decoders, Multiplexers and Demultiplexers.

UNIT-IV

Sequential logic- Flip-Flops - RS, D, JK & T Flip-Flop, Triggering in flip flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, flip flop excitation tables, Design procedure and design of counters. Design with

UNIT-V

Registers, Counters and the memory unit, Shift registers, Ripple counters and Synchronous counters, Inter-register Transfer, Arithmetic Logic and Shift Micro Operation, Conditional Control Statement, Instruction Codes, Processor organization, design of a simple computer.

TEXT & REFERENCE BOOKS:

- *DIGITAL LOGIC AND COMPUTER DESIGN BY MORRIS MANO*
- *COMPUTER SYSTEM ARCHITECTURE BY MORRIS MANO*



<p>UNIT- I INTRODUCTION TO DATABASE SYSTEM Introduction To Database Systems Purpose of Database System, View Of Data, Characteristics of Database Approach, Architecture for a Database System, Advantages and Disadvantages Of DBMS, Database Users and Administrator, Database Design and ER Model , Data Model Classification.</p>
<p>UNIT-II RELATIONAL DATABASE Structure of Relational Database Database Schema, Key, Relational Operations Formal Relational Query Languages .</p>
<p>UNIT-III RELATIONAL DATABASE DESIGN Features of Good Database Design, Universal Relation, Anomalies in A Database Atomic Domain and 1NF ,Functional Dependency Theory, Decomposition Using Functional Dependency Algorithm for Decomposition, Decomposition Using Multivalued Dependency More Normal Forms, Database Design Process.</p>
<p>UNIT-IV DATABASE STORAGE AND QUERYING Basic Concepts Of Indexing and Hashing Query Processing , Measures Of Query Cost , Query Processing for Select, Sort Join Operations. Basics of Query Optimization, Transformation of Relational Expression Estimating Statistics of Expression, Choice of Evaluation Plan .</p>
<p>UNIT-V TRANSACTION MANAGEMENT Transaction Concepts, Features of Database Transaction. Concurrency Control in Database - Lock Base, Time Stamp Base, Validation Base Protocols Database Recovery System .</p>
<p>TEXT & REFERENCE BOOKS:</p> <ul style="list-style-type: none">• <i>SIL VERSCHATZ KORTH AND SUDARSHA N-DA TA BA SE SYSTEM CONCEPTS, 6TH ED. TATA MC-GRA W HILL.</i>• <i>RAGHU RAMA KR ISHNAN-DA TA BA SE MANAGEMENT SYSTEMS, 2ND ED. TATA MC-GRA W HILL</i>• <i>RAJESH NARANG – DATABASE MANAGEMENT SYSTEM, 2ND ED. PHI</i>• <i>R. ELMASRI <u>ET. AL</u> “FUNDAMENTALS OF DATABASE SYSTEMS”. 3RD EDITION – ADDISON WESLEY, (INDIAN REPRINT), NEW DELHI.</i>• <i>C.J.DATE, DATA BASE SYSTEMS, Vol I & II</i>



UNIT-I

Defining Structure, Declaration of Structure Variable, Type def, Accessing Structure Members, Nested Structures, Array of Structure, Structure Assignment, Structure as Function Argument, Function that return Structure, Union

UNIT -II

Basics of Pointers, Pointers Operators, Pointer Arithmetic, Pointers and Function, Pointer and Strings, Pointer to Structure, Pointers within Structure,

UNIT -III

Introduction to Static and Dynamic Memory Allocation, The Process of Dynamic Memory Allocation, DMA Functions: malloc(), calloc(), free(), realloc(), sizeof() Operator.

UNIT -IV

. Introduction to File Handling, File Structure, File Types : Streams, Text, Binary; File System Basics, The File Pointer, Opening a File and Closing a File, Functions for File Handling : fopen(), fclose(), getc(), fgetc(), putc(), fputc(), feof(), gets(), puts(), fgets(), fputs(), getw(), putw(), fscanf(), fprintf(), fread(), fwrite(), Standard Streams in C, Flushing a Stream, Direct Access File and Random Access to File : fseek(), ftell(), rewind(); File Name as Command Line Argument

UNIT -V

Preprocessor and its Advantages, Preprocessor Directives, Macros with and without Arguments, #Define, #Include; Creating Header Files, Include User Defined Header Files, Conditional Compilation Directives: #if, #else, #elif and #ifdef & undef; Using defined, #error, #line, #pragma, The # & ## Preprocessor Operator.

TEXT & REFERENCE BOOKS:

- *HERBERT SHIELD, "COMPLETE REFERENCE C"*
- *Y KANETKAR, "POINTERS THROUGH C "*.
- *Y KANETKAR, "TSR THROUGH C".*
- *R.S SALARIA, "APPLICA TION PROGRAMMING IN C"*



<p>UNIT - I D.T.P For Publications: Introductions to Printing, Types of Printing, Offset Printing, Working of offset Printing, Transparent Printout, Negative & Positives for Plate were making, Use of Desk Top Publishing in Publications, Importance of D.T.P in Publication, Advantage of D.T.P in Publication, Mixing of graphics & Image in a single page production, Laser printers - Use, Types, Advantage of lager printer in publication.</p>
<p>UNIT - II Page Layout: Different page format / Layouts, News paper page format, Page orientations, Columns & Gutters, Printing in reduced sizes. Introductions To Page Maker:Page Maker Icon and help, Tool Box, Styles, Menus etc., Different screen Views, Importing text/Pictures, Auto Flow, Columns, Master Pages and Stories, Story Editor, Menu Commands and short-cut commands, Spell check, Find & Replace, Import Export etc., Fonts, Points Sizes, Spacing etc., Installing</p>
<p>UNIT - III Use Of D.T.P, Use of D.T.P. in Advertisements, Books & Magazines, News Paper, Table Editor.</p>
<p>UNIT - IV Introduction to Adobe Photoshop & Documents ,Various Graphic Files and Extensions Vector Image and Raster Images, Various Colour Modes and Models.</p>
<p>UNIT - V Introduction to Screen and Work Area, Photoshop Tools & Palettes ,Use of Layers & Filters Working with Images.</p>
<p>TEXT & REFERENCE BOOKS:</p> <ul style="list-style-type: none">• <i>PA GE MAKER 4.0 & 5.0 BY B.P.O. PUBLICATIONS.</i>• <i>PRAKHAR COMPLETE COURSE FOR DTP (CORELDRAW, PAGEMAKER, PHOTOSHOP)</i>



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Sub Code: 2BCA5

Subject Name: Operating System Concepts

UNIT - I

Evolution of operating systems (History of evolution of OS with the generations of computers), Types of operating systems, Multitasking, Timesharing, Multithreading, Multiprogramming and, Real time operating systems, Different views of the operating system, System Programmer's view, User's view, Operating system concepts and structure, Layered Operating Systems, Monolithic Systems

UNIT - II

The Process concept, The process control block, Systems programmer's view of processes, Operating system services for process management, Scheduling algorithms, First come first serve, Round Robin,

UNIT - III

Memory management without swapping or paging, Concepts of swapping and paging, Page replacement algorithms namely, Least recently used, Optimal page replacement, Most recently used, Clock page replacement, First in First out (This includes discussion of Belady's anomaly and the category of Stack algorithms),

UNIT - IV

The need for inter-process synchronization, Concept of mutual exclusion, binary and counting semaphores. Concepts of deadlock detection, deadlock prevention, deadlock avoidance. Banker's Algorithm

UNIT - V

File systems, directories, file system implementation, security protection mechanisms. Disk hardware, Disk scheduling algorithms (namely First come first serve, shortest seek time first, SCAN, C-SCAN, LOOK and C-LOOK algorithms)

TEXT & REFERENCE BOOKS:

Galvin P., J.L. Abraham Silberschatz. "Operating System Concepts". John Wiley & Sons Company, 1989

Tanenbaum, A.S. "Modern Operating System", Prentice Hall of India Pvt. Ltd. 1995.

William Stallings "Operating Systems", Prentice Hall of India Pvt. Ltd.