

HONS. 1st Year

PAPER – I

Full Marks - 100

(Theory-75, Practical-25)

GROUP A: COMPUTER FUNDAMENTALS

Introduction to computers: What is Computer? Comparison between computer and human brain , Characteristics of computer , Computer applications .

History of computers : Initial development , Generation of computer , Evolution of Personal Computers.

Computer organization : Basic units of computer , Block diagram of computer , Input unit , Processing unit , Output unit , Storage unit .

Types of Printers : Hard copy output , Impact printers , Non-impact printers, Serial and line printers , Dot-Matrix printers , Laser printers , Daisy wheel printers , Drum and chain Printers , Thermal printers .

External storage devices : SASD , DASD , Punch cards , Magnetic Tapes , Blocking utilization factor , Magnetic Disk , Tracks , Sectors , Seek time , Rotational latency , Access time , Numerical problems .

Types of Computers : Digital , Analog , Hybrid Computers , General purpose Computers , Turnkey Systems , Micro computers , Mini computers , Mainframes , Super Computers .

Data Representation : Number Systems , Binary system , Binary to Decimal and Decimal to Binary conversion . Binary addition , 2's compliment representation , Binary subtraction , ASCII and EBCDIC coding .

Computer Software : Machine language , Assembly language, High level languages , Compilers , Interpreters , Assemblers .

Centralized processing , Decentralized processing , Distributed processing , Management Information System .

Processing Modes : Uniprocessor , Multiprocessor , Batch processing , Off line data entry , On-line processing , On-line data entry , real Time processing , Time sharing processing, Electronic mail , Tele text , Tele conferencing .

Programming Concepts : Programme definition , Characteristics of good programme , Programming steps , algorithms , Flowcharts .

* *Introductions, Word Processor Packages, Database Management Packages, Spreadsheet Packages, Office Automation Packages (Microsoft Office 2000/2007).

GROUP B : INTRODUCTION TO COMPUTER ARCHITECTURE

Introduction to microprocessors and associated components, Timer, display controllers, DMA controllers.

Block diagram of IBM PC . Evolution of microprocessor . Family of Intel microprocessor. Introduction to 8086 & 8088 architecture.

Functional description of various modules & cards. CISC & RISC technology. Various types of displays and other peripherals used in IBM PCs.

Boot process in IBM PC. System files. Self text.

Disk Operating System – Introduction. File management. Directory Structure in DOS. Internal and External commands of DOS.

Batch files, Configuration files, System files, COM, BIN, SYS, EXE & TXT files.

GROUP C: PROGRAMMING LOGIC AND DESIGN TECHNIQUES :-

Programme development, low-level programming language, high-level languages, programming aids, programming techniques , Programming tools , Program Maintenance .

Techniques of programming (Algorithm , flowchart , pseudocodes). Introduction to programming in QBASIC structured Programming – Introduction , Need of structured programming Development of programme in QBASIC .

BCA PRACTICAL- 1

25 Marks

Visit to computer lab. Introduction to various components of a computer . A simple documentation preparation and printing . Usage of printer and other components .

Use of External and Internal DOS commands . Programming in QBASIC.

Physical inspection of IBM PC and internal cards. Introduction to nomenclature (COM1, COM2, etc). Writing batch files for various purposes. Modify config.sys files. Creating using QBASIC programmes .

PAPER – II

Full Marks - 100

(Theory-75, Practical-25)

GROUP A: OPERATING SYSTEMS

- Introduction to various categories of softwares.
- Operating system and its function interaction of operating system with hardware and user programme.
- Various components of operating system with reference to DOS, BIOS, BIOS and DOS interrupts.
- Types of OS. Single user operating system , Task loader , Memory management .
- Device management. Control of various devices . Device drivers interrupts driven and poll driven data transfers . Need of software and hardware protocols .
- Multi-user , Multi tasking , multi processing and real time operating system .
- Introduction to memory management techniques .
- File systems , File Management , Process management and scheduling.
- Special requirements and facilities for multiprocessing environment .
- Examples of multiprocessing operating systems .
- Introduction to UNIX . User management in UNIX .
- Computers in office automation: Nature and uses of information, Formal and Informal Information and Communication, Gathering and Presenting Information.
- System development life cycle (SDLC), documentation, testing, debugging, Implementation.

GROUP B: BUSINESS APPLICATIONS

Database organization, Database files, records, fields , types of files in database .
File organization: Sequential file, Random file , Indexed file .
MS-Office: Word, Excel. Powerpoint & Ms-Access (2007), Windows 98/2000

GROUP C: FOXPRO: VIEWING AND EDITING DATA

- ❖ FoxPro-version, features, requirements of hardware and software
- ❖ FoxPro –Menu system
- ❖ creating database file, operation of data base(create, list, append, close, quit)
- ❖ FoxPro- data type
- ❖ Data displaying and monitoring commands: DISPLAY, LIST
LOCATE,EDIT,CHANGE,BROWSE,REPLACE,DELETE,RECALL,PACK(all
commands with various options)
- ❖ File utilities in FoxPro- DISPLAY DIRECTORY, COPPY DELETE,RENAME

FOXPRO:INDEXING , SORTING AND PRINTING REPORT

- ❖ Indexing concept and sorting
- ❖ Sort Commands- single & Multiple Key
- ❖ Advantages and disadvantages of sort
- ❖ Indexing vs Sorting & Multiple Key
- ❖ Indexing , FIND, SEEK Rushmore Technology

- ❖ FoxPro Report- its creation, feature & Utilities, Preview, Printing Custom Report, grouping & sub grouping.
- ❖ FoxPro Level- Designing and Printing

FOXPRO: Memory variables, Keyboard Macros and Function

- ❖ memory variables-creation and uses, simple vs array
- ❖ saving and restoring memory variables
- ❖ ?/?/?/? commands
- ❖ time & date functions and commands, date arithmetic
- ❖ converting defining function keys
- ❖ keyboard Macros-creating and using
- ❖ Arithmetic operations, Mathematical functions, mathematical Commands, Statistical Functions

Programing and Error Debugging :

- ❖ Concept of FoxPro commands file, Modify commands
- ❖ conditioning, branching and looping within Programme file with Do-While Enddo, if-Endif, Scan- Endscan, For-Endfor, Docase-Endcase, Text-Endtext, Executing commands from other command files, Macro substitution
- ❖ Common Error Message
- ❖ debugging techniques and commands

Multiple Data file and custom screens:

- ❖ Concept of Multiple Database File, Using multiple database-SET RELATION,UPDATE,APPEND FROM, COPY TO, JOIN, Relation Query by example .
- ❖ create custom screen with @,@_GET,@_EDIT,@SAY_GET_READ,Creating Box &Line, User define functions, Custom Screen Designing and their uses, FoxDoc for Documentation

Text & References: 1. FOXPRO made Simple : by R. K. Taxali, BPB
2. MASTERING FOXPRO 2.5 BPB Publication

BCA PRACTICAL Paper-I

25 Marks

Development of a batch files to install software from floppy to disk. Development of a batch files to manage various packages on the disk. Detection of viruses and protection packages on IBM PC. MS-OFFICE, WINDOWS 2007.

BCA- HONS. IInd Year

PAPER – III

Full Marks - 100

(Theory -75, Practical - 25)

GROUP A: COMPUTER NETWORKING

Introduction to the N/W , Network Topologies , Types of channels : Twisted Wire , Co-axial wire , Microwave Communication , Satellite Communication , Optical fiber , Simplex , Duplex , Half Duplex Communication , Switching Techniques : Circuit Switching , Message Switching , Packet Switching , FEP , Repeaters , Bridge , Gateway , Token passing CS/CD , Protocols , ISO-OSI Model, NIC , Serial and Parallel Communications.

GROUP B: INTERNET

- Evolution , Protocols, Interface Concept, Internet Vs Intranet, Growth of internet, ISP, Connectivity-Dial-Up, Leased Line, VSAT, etc URLs, Domain Names, Portals, Application
- E-Mail Concept, POP and Web Based E-Mail, address, Basics of sending and receiving , E-mail protocols, Mailing list,
- Free Email services..

GROUP C: BOOLEAN ALGEBRA

Boolean Algebra, Rules and Theorems, De'Morgan Theorem , Duality Principal, Logical gates, Canonical equations, K-Maps, Half Adder, encoder ,decoder.

GROUP D: PROGRAMMING LANGUAGE

Methods of documentation. Methods of analyzing a program requirement. Data flow diagrams.

C-PROGRAMMING LANGUAGE

Unit I

- Overview of C
- Introduction & features of C
- Structure of C Program
- Variables, Expressions, Identifiers, Keywords, Data Types, Constants
- Operators and Expressions
- Operator : Arithmetic, Logical, Relational, Conditional and Bitwise Operators
- Precedence and Associativity of Operators,
- Type Conversion in Expression

Unit II

- Basic Input/Output and Library Functions
- Single character input/output, i.e. getch(), getchar(), getche(), putchar()
- Formatted input/output i.e. printf() and scanf()
- Library functions - concepts, Mathematical & Character functions.

- Control Structure
- If statements, If-Else statements, Nesting of If-Else Statements, else if ladder
- The ?: Operator
- goto statement
- Switch statement
- Compound Statement
- Loop controls
- for, while, do-while loops
- break, continue, goto statement

Unit - III

- Single and Multi Dimensional arrays
- Array declaration and initialization of Arrays
- Strings : declaration, initialisation, functions.

Unit - IV

- Functions
- The need and form of C functions
- Userdefined and library functions
- Function arguments
- Return values and nesting of function
- Recursion
- Calling of functions
- Array as function argument
- Scope and life of variable- local and global variable
- Storage class specifier-auto, extern, static, register

Unit -V

- Structure and union
- Defining structure
- Declaration of structure variable
- Accessing structure member
- nested Structure
- Array of Structure
- Structure Assignment
- Structure as function argument
- union

Unit VI

- Basic of pointers, operators, Pointers and function
- passing arrays to function
- array pointers
- pointers strings
- pointers to structure
- pointers within structure

Unit VII

Dynamic Memory Allocation

- the process of memory allocation
- malloc() operator
- size of ()operator

- function calloc()
- function free()
- function realloc()

Unit VIII

File handling

- File Structure
- File Handling Function
- File Type
- Streams
- Text
- Binary
- File Pointer
- Opening File And Closing File
- Writing And Reading A Character
- Using fopen(),getc(),putc() &fclose()
- Using feof()
- Working With String fputs &fgets
- Flushing Stream
- Using fread(),fwrite(),&rewrite()
- Direct Access File

Unit IX

Preprocessor Directive & Commands

- the Preprocessor
- #define
- defining like macros
- #error
- #include
- conditional compilation directive i.e #if,#else,#elif and #ifdef &#undef
- #line

Unit - X

Direct access color graphics

- Initialise graphics mode
- function used in graphics
- Bitwise operator

Unit XI

Screen Control

- Creation of windows
- text attributes control
- extended keywords code
- menu design
- word processing

Text & References Books

- ☞ Pointor Through C - Y. Kanitkar
- ☞ TSR through C - Y.Kanitkar

☞ Programing in C - E.Balaguru swami

PRACTICAL

Programming in C language and project development.

SIMTECH

PAPER – IV

Full Marks - 100

(Theory -75, Practical - 25)

Data Structure

Introduction to data structure

- concept of data structure
- Abstract data Structure
- Analysis of Algorithm
- The concept of List

Stack and Queues

- Introduction to stack & primitive operation on stack
- Stack as an abstract data type
- Multiple Stack
- Stack application: infix, postfix, prefix and recursion
- Introduction to queues
- Primitive operation on the queues
- Queues as an abstract data type
- Circular Queue
- Dequeue
- Priority queue

Linked List

- Introduction to the linked list of Stack
- The Linked List of Queue
- Header nodes
- Doubly Linked List
- Circular Linked List
- Stack & Queue as a circular linked List
- Application of Linked List

Trees

- Basic Terminology
- Binary Tree
- The Tree representation as Array & Linked List
- Binary tree representation
- Traversal of Binary tree: In order, Preorder & Post order
- Application of Binary Tree
- Threaded Binary Tree
- B-Tree & Height Balanced tree , representation of B+ & B* trees
- Binary tree representation of trees
- Counting Binary trees

Searching and Sorting

- Sequential Searching
- Binary Search
- Insertion Sort
- Selection Sort

- Quick Sort
- Bubble Sort
- Radix Sort
- Shell Sort
- Heap Sort
- Comparison of Sorting Methods

Tables and graphs

- Hash Table
- Collision resolution Technique
- Introduction to Graphs
- Definition
- Terminology
- Directed, Undirected & Weighted Graph
- Representation of Graphs
- Graph Traversal-Depth First & Breadth First Search
- Spanning Tree, Minimum Spanning Tree
- The Basic Greedy Strategy for computing Algorithm of Kruskal and Prims

Text & References Books

- ☞ Fundamentals of Data Structure: By S. Sawhney & Horowitz
- ☞ Data Structure : R.B. Patel
- ☞ Data Structure : Tannenbaum

COMPUTER AIDED DRAFTING

Introduction to AUTOCAD/ROBOCAD or similar package . Advanced features of these packages.
Drawing plan of a building using AUTOCAD etc. Analysis feature of AutoCAD

PRACTICAL

Design of layout of a building. Design of interior of its rooms. Printing and plotting the prepared drawings.

Fashion designing through AutoCAD .

BCA- HONS. IIIrd YEAR

PAPER – V

Full Marks - 100

(Theory -100)

GROUP A PROGRAMMING IN VISUAL BASIC

The Integrated Development Environment of Visual Basic

- Menu Bar, tool bar, Project Explorer, tool Box, the Properties Window
- The form Designer
- Immediate Window
- Edit View, Run, Debug, Options
- Using the Application Wizard

Mapping Project

- Concept of VB Project
- Creating the Project
- Opening, renaming and saving the Projects

Elements of the user interface

- Designing the user interface
- creating forms and code modules
- aligning
- running the application
- programming an application
- programming the command buttons
- grouping controls

Visual Development and event -driven programming

- common Properties
- methods and common properties

Customising the environment

- editor tab, format tab, general tab , docking tab, environment tab

Introduction to Visual Basic Lang

Variable

- declaring variable type of variable converting variable type
- user define data type
- special values
- forcing variable declarations
- a variable's scope

Constant

- arrays
- collections
- procedures, subroutines, functions, arguments
- control flow statement and conditional statements
- loop statements
- iteration

Working with forms

- loading

- showing and hiding forms
- controlling one form within another
- using form templates
- Menus
- designing menus
- programming menu commands
- using access and shortcut keys
- mapping menus at runtime
- mouse conflicts, dragging list items using message boxes and input dialogs
- using standard modules instead of form modules

ActiveX Commands

The text box control

- basic properties
- manipulating the control's text
- text selection
- search and replace operations
- capturing key strokes

List box and combo box controls

- basic properties
- the list box controls methods, arrows
- indexing with the list box controls
- searching a sort list

The Scroll box and slider control

- scroll bar control
- scroll bar control's event

Dialog Box

- using the common dialog controls
- color common dialog box
- font dialog box
- the file open and file common dialog box
- print dialog box
- help dialog box
- file controls
- the built Active X controls

Component of Visual Basic

- classes, instances, objects
- encapsulation and abstraction
- Derived classes and base classes, class in
- Dynamic Binding, creating object, variables forms as a classes
- creating manipulating runtime controls the object browser
- object linking and embedding

Graphics with Visual Basic

- Form, picture box and image box controls sizing image loading and saving images
- exchanging image through the clipboard
- coordinate systems, scale properties and methods
- the drawing methods, drawing text, drawing boxes filling
- drawing curves, manipulating pixels, specifying colors, specifying gradients
- Event driven programming, Multiple document interface (MDI)

- Interface with Visual Basic And Windows API
- Dynamic Link- Libraries
- Programming and interfacing with office

GROUP B: DATABASE MANAGEMENT SYSTEM – I

Categorisation of DBMS systems. Network, Hierarchical and Relational database. Application of DBMS system. Entity relationship charts.

Relational Database Management Systems (RDBMS). Why to use them and where. Data Manipulation Language (DML) and Data Control Language (DCL).

Security consideration in DBMS, performance improvement in databases.

GROUP C: DATABASE MANAGEMENT SYSTEM – II

Relational Database – advance concepts. Introduction to ORACLE / INGRESS or a similar RDBMS on a multi user environment.

Structured Query Language (SQL). Form design on an advanced RDBMS. Report generation. Query by example (QBE) and Report by form. Accessing RDBMS using management. Security consideration

PAPER – VI

Full Marks - 100

(Theory -100)

GROUP A: OBJECT ORIENTED PROGRAMMING

Introduction to object oriented programming & C++

Objects

Polymorphism

Inheritance

C++ Fundamentals

Classes and Objects

Function overloading

Operator overloading

Constructors & Destructors

Multiple inheritances

Passing objects to functions

Array of objects

Pointers to object

C++ I/O class library

C++ Stream

C++ Predefined Streams

C++ Stream classes

GROUP B

JAVA PROGRAMMING

Over View of Java Lang.

- JAVA Program Structure, tokens, java virtual machine, constant & variables, data types, declaration of variables, scope of variables, symbolic constants, type casting
- operators: arithmetic , relational, logical assignment , increment and decrement, conditional, bitwise, special, expression and its evaluation
- decision making and branching
if statement, if.. else statement, nesting of if ..else statements, else..if ladder, switch? operator, loops, while, do, for, jumping loops, labeled loops

Classes, object, methods

- defining class , adding variable and methods, creating object, accessing class members, constructor, methods of overloading, static members, nesting of methods
- inheritance: extending a class , overriding methods, final variable and methods, final classes , finalize methods, abstract methods and classes , visibility control
- array , String and vectors
- array: one dimensional, two dimensional strings, vectors, wrapper classes, defining interfaces, extending interfaces, implementing interfaces, accessing interfaces,
- Multithreaded Programming
creating threads, extending the threads class stopping and blocking a thread, life cycle of thread, using thread methods, thread exception, thread priority, synchronization, implementing the runnable interface

Applet programming

- Local and remote applets, applets vs application writing applets, applets, applets life cycle, creating and executable applets, designing a Web page, applet tag, adding applet to html, running the applet, passing, parameters to, applets, aligning the display,

GROUP C: ADVANCE TOPICS IN COMPUTERS

Introduction to :

Computer animation, Artificial intelligence. Dedicated computers, ATM. Data encryption. Data communication and networking (course to be modified every year to take care of latest development). Visit to a computer industry.

PAPER – VII

Full Marks - 100

(Project -100)

Design of a database for a business application. Design of data entry forms and reports layouts for this databases. Creation of programmes to access and manipulation of the databases.

Development of a business application in RDBMS.
Creating, merging, deleting tables.

Project Preparation & Viva-Voce

PAPER – VIII

Full Marks - 100

(Project -100)

Prepare a Project in C++ Programming.
Project Preparation & Viva-Voce.