

Syllabus For BCA

Part - I

Honours Paper - I

PAPER CODE : 1001

PAPER NAME : COMPUTER FUNDAMENTALS AND ORGANIZATIONS

Computer – A definition
Basic Anatomy of Computers
Classification of Computers
Computer Applications
Peripheral Devices
Memory and Registers
Computer codes and arithmetic
Types of Processing
Networking
Introduction to Microprocessors and associated components, timers, display controllers, DMA controllers
Block diagram of IBM PC
Introduction to X86 family, functional descriptions of various models and cards
Various types of displays and other peripherals used in IBM PCs

DETAILS COVERED:

FUNDAMENTALS OF COMPUTERS

1. Computer - A Definition
Data, Processing, Information
2. Basic Anatomy of Computers
Bits, Bytes and Words
Input, Output, CPU, Peripheral devices, Backing storage
Input interface, Output interface, Microprocessor
3. Classification of Computers
On the basis of generation
Micro, Mini, Super, Mainframe
Digital, Analog, Hybrid
4. Computer Applications
In Business & Industry, Science & Technology, Education, Health, Communication, Banking & Other Public Services
5. Peripheral devices
Input Device
Keyboard, Mouse, Joystick, Trackball, Touch Panels, OMR, OCR, MICR, Data Glove, Digitizers, Image Scanners, Light Pen, Voice System
Output Devices
Printers
Impact printers and non-impact Printers, Character Printers, Line Printers and Page Printers, Dot Matrix, Daisy wheel, Thermal, Laser, Inkjet, Electrostatic, Drum Printer, Chain Printer
Plotters
Drum and Flat Bed Plotters
VDU
Visual Display Adapters, LCD
Secondary Storage devices
Magnetic Disk (Winchester and hard disks), Magnetic Tape, Floppy Disk,

Optical (Video or laser disk), CD

6. Memory and register

Primary memory, Secondary memory, cache memory

RAM – SRAM, DRAM

ROM – PROM, EPROM, EEPROM, CDROM, ROM BIOS, Buses

Registers – Program counter, Memory buffer register, memory address register, Accumulator

Cache memory

7. Computer Codes and Arithmetic –

Number system

(i) Positional:- Decimal, Binary, Octal, Hexadecimal

(ii) Non Positional (Roman)

Conversion of Decimal number in other systems and vice-versa

Binary Arithmetic – Addition, Subtraction (1's complement, 2's complement), Multiplication, Division

Boolean Algebra - Basic Gates (OR, AND, NAND, NOT, XOR, NOR).

8. Types of processing

(i) Batch processing (ii) On-line processing (iii) Real-time processing

9. Introduction to-

OS, Utilities, Compilers/Interpreters, Assemblers, Multiprogramming, Multitasking, Multiprocessor, Multimedia, Internet

10. Networking

Topologies (Bus, Star, Ring, Mixed)

Transmission Media,

Advantages and disadvantages of networking, LAN, WAN

COMPUTER ORGANIZATIONS

1. 8086, 8088, 80286, 80386, 80486, P5

2. Real mode & protected mode, Difference between DX & SX of different microprocessor, bus width

3. Clock pulse generator, DMA controller, PIC (programmed interrupt controller), memory, ports, Communications

4. Block diagram of IBM PC, Types of motherboards, Expansion slots, Adaptor cards, SMPS, Controllers cards

5. Video – raster scanning & interleaved double scan

Displays -MDA, CGA, HGA, EGA, VGA, SVGA

6. Architecture - ISA, EISA (Brief description)

DOS (For lab. Only)

Directory Structure

File naming convention and valid characters for filenames

Internal Commands : CLS, DIR, COPY CON, TYPE, REN, COPY, DATE , TIME, DEL, MD, RD, CD, ERASE, PROMPT, ECHO, PATH, PAUSE, SET, VER, VOL, REM.

(.) current directory, (..) root directory

External Commands : FORMAT, CHKDSK, SCANDISK, DISCOPY, SORT, FIND, SHIFT ATTRIB, XCOPY, TREE, UNDELETE, EDIT, DELTREE, MOVE, DEFRAG, MORE, IF EXIT, BREAK, VERIFY,

Redirection, Pipes, Command line parameter.

Executable files, Text files, Batch files

PAPER 1101 : PRACTICALS

Based on DOS commands and batch files.

Book referred :

1. Computer Fundamental Architecture and Organization - B. Ram
2. Computer fundamentals - Sukhvir Singh (Khanna Publication)
3. “ O ” level (Module – I) Information Technology - V. K. Jain
4. Introduction to IBM PC – Peter Nortan
5. Microprocessor Architecture, Programming Applications – Ramesh S. Gaonakar
6. Illustrated MS-DOS 6.22 – Russell A. Stultz

Honours Paper – II

PAPER CODE : 1002

PAPER NAME : Programming Techniques

Techniques of Programming (Flow Chart, Pseudocodes)

Introduction to C Programming

Data types in C

Operators & Expressions

Control Flow

Functions and Program Structure

Arrays

Pointers

Structures and Unions

Pointers to Structures

Sorting

File Handling

Basics of Assembly Language

DETAILS COVERED

1. PROGRAMMING TECHNIQUES AND PRACTICALS

Data, Constants and Variables

Flowchart

Introduction to Pseudocode

Selection, Iteration

Modular Approach

Array,

Sorting (LINEAR ,BUBBLE)

Searching (SEQUENTIAL, BINARY)

2. 'C' Programming -

- (i) Features of 'C' language, character set, tokens, identifiers, keywords, constants, variables, storage class (auto, static, register, external)
- (ii) Data types and sizes (char, int, float, short int, long int, unsigned, double, enumerated), Operations and expressions (Arithmetic, logical, relational, compound assignment, increment and decrement, conditional and special types of statement, type conversion)
- (iii) Header files, library files, preprocessor directives, linking and compilation process
- (iv) Control flow – statements and blocks, if, if-else, nested if-else, goto, switch, break, continue, while loop, do-while loop, for loop
- (v) Library Functions –

I/O functions: `getc()`, `putc()`, `getchar()`, `putchar()`, `puts()`, `gets()`, `scanf()`, `printf()`, `fflush()`.

String functions: `strcpy()`, `strcmp()`, `strcat()`, `strlen()`

Character functions : `isupper()`, `islower()`, `isalpha()`, `isdigit()`, `isalnum()`, `isspace()`, `tolower()`, `toupper()`, `log()`, `pow()`, `sqrt()`, `sin()`, `cos()`, `tan()`

Some other general functions : `sleep()`, `system()`, `atoi()`, `malloc()`, `free()`, `exit()`

User defined functions - function components, passing data to function, function return data type, parameter passing (call by value, call by reference), recursive functions, storage class (local variables, global variables)

- (vi) Arrays - operations on arrays, single and multi dimensional, arrays, passing array to function
- (vii) Structure and Union - structure declaration and definition, accessing, nesting of structure, array of structure, structures and functions, unions, difference between structure and union
- (viii) Pointer and its operator - &, *, pointer arithmetic, pointers to constants, constant pointers, array of pointers, pointer to function, pointer to structure.
- (ix) Command line arguments: *argv[], *argc
- (x) Files : Opening modes, FILE, fread(), fopen(), fwrite(), feof(), fgetc(), fputc(), fgets(), fputs(), rewind(), fscanf(), fprintf(), fclose(), ftell(), fseek(),

3. BASICS OF ASSEMBLY LANGUAGE

- (i) Assembly directives and operations : data definition and storage allocation, structuring, assigning names to directives, alignment directives, value returning attributes operator
- (ii) Instruction set 8086
- (iii) Simple program with respect to data transfer and string manipulation using MS Assembler

PAPER 1102 : PRACTICALS - Based on 'C' programming

Books referred :

1. ANSIC - E. Balagurusamy
2. Programming with C - Gottfried (TMH)
3. Introduction to MS- Assembler - Venugopal

Honours Paper – III

PAPER CODE : 1003

PAPER NAME : Office Automation

Windows

Getting Started, Windows Basics, Help, Working With Disks, folders and Files, Important Techniques and Timesavers, Personalizing Windows, Accessories

Microsoft Excel

Getting Started, Saving and Opening Workbooks, Editing Worksheets, Using Formulae and functions, Working with Rows and Columns, Formatting Worksheets, Printing Worksheets, Using Multiple Worksheets, Charting Data, Database management, Introduction to Macro

Microsoft PowerPoint

Getting Started, Saving and Opening Slides, Editing Slides, Viewing Slides, Using Multiple Slides, Formatting Slides, Slide Presentation, Drawing Shapes

Microsoft Word

Getting Started, Saving and Opening Documents, Editing Documents, Smart Editing, Using Multiple Documents, Printing Documents, Format Characters, Format Paragraphs, Format Pages, Working With Tables

Details Covered

Windows

Getting Started

- Startup Windows95
- Tip of the day
- Windows95 desktop and taskbar
- Starting programs via the Start menu
- Double-clicking to start programs
- Quitting programs
- Shutting down and quitting windows
- Startup Group

Windows Basics

- Parent and child windows, parts of a window
- Opening, activating, hiding (minimizing), resizing
- Scrolling, arranging and closing a window
- Moving information from one window to another

Help

- Context sensitive help
- Search for help

Working with disks, folders, and files

- Disk icons and their window
- The Windows Explorer
- Creating and naming new folders
- Moving and copying folders and files
- Deleting folders and files
- Emptying the recycle bin
- Naming files
- File types in windows95
- Associating files with programs

- Renaming files
- Finding lost files

Important techniques and timesavers

- Moving or copying by dragging and dropping
- Moving or copying by creating scraps
- Shortcut icons
- Property settings
- Object linking and embedding

Personalizing windows98

- The welcome screens and tips
- Adding programs to the Start menu
- Clock, Calendar, Regional Settings
- Mouse behavior and mouse property window
- Desktop pattern and wallpaper
- Windows colour scheme
- Screen Savers

Accessories

- Ms-Paint
- Notepad
- Calculator
- WordPad

Microsoft Excel

Getting Started

- Excel basics
- Enter data
- Select cells
- Using Auto fill
- Move through a worksheet
- Getting help

Saving and opening workbooks

- Save a workbook
- Close a workbook
- Exit excel
- Open a workbook
- Create a new workbook
- Switch between workbooks

Editing worksheets

- Edit data
- Clear data
- Undo last change
- Move data
- Copy data
- Check spelling

Using formulae and functions

- Formulae
- Enter a formula
- Functions
- Enter a function
- Add numbers
- Copy formulas

Working with rows and columns

- Insert a row or column
- Delete a row or column
- Change column width
- Change column height

Formatting worksheets

- Change appearance of numbers
- Change margins
- Center data across column
- Bold, Italic and Underline
- Clear formats
- Change fonts and borders

Using multiple worksheets

- Switch between worksheets
- Copy or move data between worksheets

Charting Data

- Create a chart
- Move a chart
- Size a chart
- Print a chart
- Change chart type

Database management

- Goal seek
- Data sort
- Data filtering
- Sub-totaling
- Pivot table
- Scenario manager

Introduction to Macro

Microsoft PowerPoint

Getting Started

- Create new slide
- Select slide
- Enter data
- Getting help

Saving and opening slides

- Save a new slide
- Close a slide
- Exit PowerPoint

Editing Slides

- Insert slide
- Delete slide
- Clear slide
- Duplicate slide

Viewing slides

- Normal view
- Outline view
- Slide view
- Slide presentation

Using multiple slides

- Create new slides
- Insert time, date, page no.
- Copy slides from file
- Copy objects from Ms-Word
- Copy graphs from Ms-Excel

Formatting slides

- Change data alignment
- Change fonts
- Change bullets, numbers
- Create periods

Slide presentation

- Presentation templates
- Change wizards
- Change slide background
- Change slide colour

Drawing shapes

- Group slides
- Rotate picture
- Change picture color
- Crop picture

Microsoft Word

Getting Started

- Enter text
- Move through a documents
- Delete text
- Getting help

Editing documents

- Insert text
- Delete text
- Replace selected text
- Undo changes
- Redo changes
- Change the case of text
- Move text
- Copy text
- Change views

Saving and opening a documents

- Save a new document
- Close a document
- Exit Ms-Word
- Open a document

Smart editing

- Find text
- Replace text
- Check spelling
- Using auto correct
- Using the thesaurus
- Check grammar

Using multiple documents

- Create a new document
- Arrange open documents
- Copy or move text between documents
- Maximize a document
- Switch between documents

Printing documents

- Preview a document
- Print a document

Format characters

- Bold, Underline and Italics
- Change fonts
- Insert a symbol

Format paragraphs

- Change line spacing
- Change paragraph alignment
- Display or hide the ruler
- Change tab settings
- Indent paragraphs
- Create numbered and bulleted lists

Format pages

- Insert a page break
- Create a new section
- Change margins
- Add headers and footers
- Center a page

Working with tables

- Create a table
- Type a text
- Add a row or column
- Delete a row or column
- Change column width
- Format a table

PRACTICALS

Based on Microsoft Word, Microsoft Excel and Microsoft PowerPoint
Using mail merge or any other tools of Microsoft Word, Creating charts or data handling in excel,
preparing slides and import files like chart from Excel in Microsoft PowerPoint.

Books referred :

1. Windows95 for Busy People - Ron Mansfield
2. Easy Guide to Windows95 - Alan Simpson
3. Microsoft Office Professional for Windows95

Honours Paper – IV

PAPER CODE : 1004

PAPER NAME : BUSINESS DATA PROCESSING

Information and Management

Data Processing Methods

Data Input Methods

Business Files : Fields and Records

File Organizations

Overview of various Business Applications and their characteristics

Cobol Programming

DETAILS COVERED

1. Introduction to data processing, data collection, preparation, verification, editing and validation, Types of information, qualities of information, various ways of collecting information, Data input methods (on-line & off-line), Data processing methods (on-line & batch processing).
2. Business files – Elements, Fields and records.
3. File Organization – Serial file, sequential file, indexed sequential file, direct or random file, hashing techniques for direct files, addressing techniques.
4. Overview of various Business Application :

Characteristics of business organization, use of computer in various areas of business : Sales, Control and accounting, Cost accounting, Inventory control, Payroll etc.

COBOL PROGRAMMING :

1. INTRODUCTION TO COBOL –
Structure of a COBOL program, DIVISIONS, SECTIONS, PARAGRAPHS etc.
COBOL character set, Digits, Letters & Special characters,
Words, Literals, Figurative constants, Identifiers, PICTURE clause, edit characters
(2,*,+,-,CR,DB,/ etc)
2. IDENTIFICATION DIVISION
3. ENVIRONMENT DIVISION :
Configuration Section
Input-Output Section
File-Control
Select – assign- organization –access
4. DATA DIVISION
File section (Sequential, Line sequential & Indexed file)
Screen Section
Working-Storage Section
Table Handling
Index Data Items,
Condition name condition
Linkage section
Other clauses like VALUE, USAGE, SIGN IS, BLANK, WHEN ZERO, JUSTIFIED,
REDEFINES, OCCURS, RENAME.
Level of data – 01 to 49, 77 to 88

5. PROCEDURE DIVISION

Input/Output Statements

Data Movement

Arithmetic Operators

Compute Statement

Control Statement: GOTO, GOTO...DEPENDING ON, PERFORM, IF AND ELSE

SORT, MERGE, and SEARCH, STRING, UNSTRING.

Inter program Communication,

CALL USING, CHAIN

PAPER 1104:PRACTICALS

Development of a business application using COBOL.

Books referred:

1. Structured COBOL Programming – Stern & Stern
2. COBOL Programming – M. K. Roy & D. Ghosh Dastidar
3. Analysis and Design of Information System- V. Rajaraman
4. O LEVEL (Module III)
5. System Design and Business Application – V. K. Jain

Subsidiary Paper

PAPER CODE :

PAPER NAME : Mathematics

Stress should be given on development of ideas and theories rather than on solving problems. Problems should be short and intelligent.

Paper 1 -100 Marks

1. Set theory -2 questions.
2. Abstract Algebra and Matrices – 2 questions
3. Trigonometry-2 questions
4. Real Analysis-3 questions
5. Co-ordinate Geometry of two dimensions-2 questions.
6. Differential Calculus -3 questions
7. Vector Analysis - 2 questions

The question paper will be divided into three sections A, B and C. The examinees will be required to answer eight questions, selecting at least one from each section.

Section A- Set theory, Abstract Algebra and Matrices, Trigonometry.

Section B- Real Analysis, Co-ordinate Geometry of two dimensions.

Section C- Differential Calculus, Vector Analysis.

SET THEORY

General form of De Morgan Laws; Cartesian product of sets; Equivalence relation induced by a partition of a set and Fundamental theorem on equivalence relation; Composition and Factorization of mapping, Set mapping, Countability of rational, real and algebraic number systems.

ABSTRACT ALGEBRA & MATRICES

Binary operations: Definition of group, Abelian group with examples, Uniqueness of identity element in a group, Cancellation laws in a group, Definition of subgroup and cyclic group with examples; Definition of ring, integral domain and field with examples. Definition of matrix, Operations of matrix algebra, kinds of matrices, transpose, adjoint and inverse of a matrix.

Product of determinants, Solution of consistent system of linear equations.

TRIGONOMETRY

De Moivre's theorem and its applications, Expansion of $\sin x$, $\cos x$ and $\tan x$, Complex argument, Trigonometric functions of complex angles, Hyperbolic functions, Gregory's series, Summation of series.

REAL ANALYSIS

Sequences of real numbers and their limits, Bounded sequences, Monotonic sequences, Cauchy's general principle of convergence. Convergent and divergent series Convergence of series of Positive terms, Comparison test, Cauchy's root test, D'Alembert's ratio test and Raabe's test, Alternating series and Leibnitz's test, Absolute convergence of series.

Continuity and differentiability of real functions of one variable, Properties of continuous functions.

CO-ORDINATE GEOMETRY OF TWO DIMENSIONS

System of circles: Orthogonal circles, Co-axial circles; Parabola, Ellipse and Hyperbola, their standard equations; Equations of tangents and normals; General equation of the second degree, Conditions for different types of conic sections.

DIFFERENTIAL CALCULUS

Successive differentiation and Leibnitz's theorem. Taylor's series and Maclaurin's series, Partial differentiation: Euler's theorem; Indeterminate forms. Equation of tangents and normals. Asymptotes, Formulae for radius of curvature of different coordinate systems.

VECTOR ANALYSIS

Triple products of vectors, differentiation of vector point functions: Differentiation of product of vectors. Gradient of a vector, Divergence and curl of vectors in cartesian coordinates.

STATISTICS

B. Sc. Part 1(Subsidiary)

The paper will contain three groups. The examinees will be required to answer in all 5 questions, selecting at least one question from each group. The number of questions to be set is indicated against each group.

Group A: General Statistics (Four Questions)

Definition and scope of Statistics, Frequency distribution. Various measures of location and dispersion. Moments. Measure of skewness and kurtosis. Scatter diagram, Bivariate table, Regression and method of least squares, Correlation Coefficients, Standard Error of Estimate, Partial and Multiple Correlation and Regression Coefficients (for three variables only.)

GROUP B: Probability and Probability Distributions (Three Questions.)

Concept of sample space. Events, etc. Definition of probability, Calculation of Probability by enumeration, Total and Compound Theorems of probability. Concept of Conditional probability, Baye's theorem, Random variable, Distribution Function, Mathematical Expectation, Moment Generating Function, Geometric, Binomial & Poisson Distribution, Rectangular and Normal Distributions with their properties.

GROUP C: Calculus of Finite Differences (Three Questions)

Introduction to Difference operators. Interpolation with equal as well as unequal intervals. Newton's and Lagrange's formulae with their proofs, Central difference formulae; Gauss's Forward and Backward Formulae, Stirling's formula. Numerical Integration: Trapezoidal rule; Simpson's one-third rule and three-eighth rule.

Paper I (Practical) 25 Marks

Practical Problem will be of three hours duration and based on Paper I (Theory). The distribution of 25 is as follow

Practical Examination	20
Practical Note Book	5

Books Recommended:

1. Fundamental of statistics Vol 1- Goon, Gupta, and Das Gupta
2. 2. Finite Differences- H.C.Saxena

B. A. Part 1(Subsidiary)

(100 marks)

ECONOMICS SYLLABUS

1. Micro & Macro Economics
2. Law of demand, Marshallian Analysis of Consumers Equilibrium.
3. Law of Diminishing Returns.
4. Theories of Population
5. Value Under Perfect Competition
6. Value under Monopoly
7. Marginal Productivity Theory of distribution
8. Modern Theory of Rent
9. Demand and supply theory of wages
10. Liquidity preference theory of interest
11. F.h.knights theory of profit
12. Role of money under planned & unplanned economy.
13. Fishers & cambridge version of the qun. Theory of money
14. Inflation, causes, effect & remedies.
15. Credit creation by commercial bank, credit control by Central bank
16. I.m.f.& world bank, objective & working
17. Ability to pay principle of taxation.
18. Growth of pub.exp.-causes & effects
19. Comparative cost theory of int. trade
20. Free trade & protection.

Books recommended:

1. H.L. Ahuja – Micro Economics
2. M.L. Jhingan - Micro Economics
3. Jain - Theory of Economics
4. M.L. Jhingan - Money, Banking and International
5. B.P. Tyagi - Public Finance (Hindi and English)
6. Suman - Moteric Arthsastra