Syllabus of BCA Part I 2022-23 Onwards

BCA-101: Computer Fundamentals and Office Management Tools

Question Paper pattern for Main University Examination *Max Marks: 100*

Part – I (very short answer) consists 10 questions of **two marks** each with two questions from each unit Maximum limit for each question is up to 40 words.
Part – II (short answer) consists 5 questions of **four marks** each with one question from each unit. Maximum limit for each question is up to 80 words.
Part – III (Long answer) consists 5 questions of **twelve marks** each with one question from each unit with internal choice.

UNIT- I

Introduction to Computers: Characteristics of computers, Evolution of computers, generation of computers, Block diagram of computer & role of each block, classification of computers, applications of computers.

Input and Output Devices: Keyboard, pointing devices, speech recognition, digital camera, scanners, optical scanners. Classification of output devices, printers, plotters, computer output microfilm (COM), Classification of output devices, devices- monitors, audio output, projectors, and terminals.

Primary and Secondary Memory: Memory hierarchy, Random access memory (RAM), types of RAM, Read only memory (ROM), types of ROM. Classification of secondary storage devices, magnetic tape, magnetic disk, optical disk.

UNIT- II

Number Systems: Introduction to number system, Binary, Octal, Hexadecimal, conversion between number bases, Arithmetic operations on binary numbers, Alphanumeric- BCD, EBCDIC, ASCII, Unicode.

Computer Software: Software definition, relationship between software and hardware, software categories, system software, application software, utility software.

Computer Languages: Introduction, classification of programming languages, generations of programming languages, features of a good programming language.

UNIT- III

MS Word: Word processing, MS-Word features, creating saving and opening documents in Word, interface, toolbars, ruler, menus, keyboard shortcut, editing, previewing, printing & formatting a document, advance features of MS Word, find & replace, using thesaurus, mail merge, handling graphics, tables, converting a Word document into various formats like-text, rich text format, Word perfect, etc.

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UNIT- IV

MS Excel: Worksheet basics, creating worksheet, entering data into worksheet, data, text, dates, alphanumeric values saving & quitting worksheet, opening and moving around in an existing worksheet, Toolbars and menus, Keyboard shortcuts, working with single and multiple workbook, working with formula & cell referencing, Auto sum, coping formulas, absolute and relative addressing, formatting of worksheet, previewing & printing worksheet, Graphs and Charts, Database, macros, multiple worksheets-concepts.

UNIT- V

Power Point: Creating and viewing a presentation, managing Slide Shows, navigating through a presentation, using hyperlinks, advanced navigation with action setting and action buttons, organizing formats with Master Slides, applying and modifying designs, adding graphics, multimedia and special effects.

Microsoft Access: Planning a database (tables, queries, forms, reports), creating and editing database, customizing tables, linking tables, designing and using forms, modifying database structure, Sorting and Indexing database, querying a database and generating reports.

Reference Books:

1. Microsoft; 2007/2010 Microsoft Office System; PHI.
2. Microsoft; Microsoft Office 2007/2010: Plain & Simple; PHI.
3. Sanjay Saxena; A First Course in Computers 2003 Edition; Vikas Pub.
4. Computer Fundamentals by P.K. Sinha, BPB Publication.
5. Computer Fundamentals and Programming in C,Reema Thareja,OXFORD University Press.
6. Introduction to Computer,Peter Norton's, Tata McGraw Hill Publication.
7. MS-Office , Dr. S.S. Shrivastava, Published by Laxmi Publication.
8. Office 2019:In Easy Steps,Michal Price ,BPB Publication.

BCA-102: Computer Architecture

Question Paper pattern for Main University Examination *Max Marks: 100*

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UNIT- I

Boolean Algebra and Logic Gates: Logic Gates, Basic laws of Boolean algebra, Simplification of Boolean algebra.
Data Representation: Number systems-Binary, Octal, Hexadecimal, Complements, Arithmetic operations, floating point representation.

UNIT-II

Sequential Logic: Sequential circuits: Flip-flops, S-R, D, J-K, T, Clocked Flip-flop. Race around condition, Master slave Flip-Flop.

Arithmetic Circuits: Half Adder, Full Adder, Half Subtractor, Full Subtractor, Parallel Binary Adder, Parallel binary Subtractor.

UNIT-III

Register Transfer and Micro Operations: Register Transfer Language, Register transfer, Bus and Memory transfer, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.

CPU Design: Specifying a CPU, design and implementation of a simple CPU (fetching instructions from memory, decoding and executing instructions, establishing required data paths).

UNIT-IV

Basic Computer Organization and Design: Instruction Codes, Computer Registers; Common bus system; Computer Instructions; Instruction formats; Instruction Cycle; Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions, Addressing Modes.

UNIT- V

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, I/O Interrupt, types of Interrupts, Priority Interrupts, Direct Memory Access(DMA).

Recommended Books

1. M. Morris Mano; Computer System Architectures; III Edition, Prentice Hall of India,2008
2. Andrew S. Tanenbaum , Structured Computer Organization,Printice Hall
3. William Stallings, Computer Organization and Architecture , Sixth Edition, Pearson
4. John D. Carpinelli: Computer Systems Organization & Architecture; 3rd Edition; Person Education Asia,2008
5. Malvino B ; Digital Computer Electronics III Edition; TMHL

BCA-103 : Operating Systems

Max Marks: 100

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Unit – I

Concepts: Operation System & its need, functions of OS, Types of OS : Simple Batch Systems, Multiprogrammed Batched Systems, Time-Sharing Systems, Parallel Systems, Distributed Systems and Real-Time Systems.

Operating-System Structures: System Components, Operating System Services, System Calls, System Structure, Virtual Machines.

Unit – II

Process Management: Process Concept, Process Scheduling, Operation on Processes.

CPU Scheduling Algorithms : Basic Concepts, Scheduling Criteria, FCFS, SJF, Priority, Round-Robin, Multilevel Queue, Multilevel Feedback Queue, Multiple-Processor Scheduling. Process Synchronization, Critical-Section Problem, Introduction to Semaphores.

Unit-III

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.

Memory Management: Background, Logical versus Physical Address space, Swapping, Contiguous allocation (fragmentation), Paging, Segmentation. Virtual Memory, Demand Paging. Page-replacement Algorithms (FIFO, Optimal, LRU, Counting).

Unit-IV

File Management: File Concepts (Operations & Attributes), Access Methods, Directory Structure, File System Structure, Allocation Methods (Contiguous Allocation, Linked Allocation, Indexed Allocation).

Device Management: General device characteristics, device controllers, device drivers, Interrupts Driven I/O, Memory Mapped I/O, Direct Memory.

Unit-V

Introduction of different Operating systems (Linux, Unix, Windows Server). Linux: History, design principles, kernel modules, process management, scheduling, memory management, file systems, input and output, inter process communication, network structure, security.

Recommended reference books:

1. A. Silbersachatz and P.Galvin, "Operating System Concepts", Addison-Wesley, 5th Ed., 2001.
2. Gary Nutt: Operating Systems-A Modern Perspective (Second Edition), Pearson Education, 2000.
3. Tanenbaum A.S., Modern Operating Systems, PHI Publ.
4. Peterson Richard, " The Complete Reference Linux " Tata McGraw Hill.
5. Sinitabha Das, "Unix/Linux Concepts & Applications", Tata McGraw Hill
6. Achyut S. Godbole: Operating Systems, Tata Mc-Graw Hill Publishing Company Limited, 2000.
7. Harvey M. Deitel, Operating Systems, Pearson Education, 2001.

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BCA-104: Principles of Programming Through C

Question Paper pattern for Main University Examination *Max Marks: 100*

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UNIT- I

Basic concepts of Programming languages, Programming Domains, Language Evaluation criteria and language categories, Evolution of major programming languages. Describing syntax and semantics, formal methods of describing syntax, Pseudo code, Design of Algorithm & Flowchart

UNIT- II

Fundamentals of C: History and importance of C, basic structure and execution of C programs, constants, variables, and data types, Various type of declarations, operators types and expressions, evaluation of expressions, operator precedence and associability. Managing input and output operations, decision making and branching.

UNIT- III

Iteration: while, do…while, for loop, nested loops, break & continue, goto statements.

Array and String: One-dimensional array and their declaration and initialization, two-dimensional arrays and their initializations, character arrays (One and Two dimensional), reading and writing strings, string - handling functions.

UNIT-IV

Functions: Need and elements for user –defined functions, definition of functions, return values and their types, function calls and declaration, recursion, parameter passing, passing arrays and strings to functions, the scope, visibility and life time of variables.

Understanding Pointers: Accessing the address of a variable, declaration and initialization of pointer variables, accessing a variable through its pointer, pointers and arrays, pointers and function arguments, functions returning pointers.

UNIT –V

Structures and Unions: Defining structure, declaring structure variable and accessing structure members, initialization of structure, operation on individual members, and array of structures, union, size of structure.

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I/O in C: Formatted and Un-formatted I/O, File handling (Random, Binary and Sequential).

Recommended Books:

1. Balagurusamy E; Programming in ANSI C;Fifth Edn; Mc Graw Hill,2011.
2. Kanetkar Y.; LET US C; X Edition, BPB,2010.
3. Deitel HM & Deitel JP; C How to program; 5th Edn; Pearson Pub
4. Gottfried B; Programming with C: Schaum Outlines; Mc Graw Hill Edition.

BCA-105 : Web Application Development

Question Paper pattern for Main University Examination *Max Marks: 100*

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Unit – I

The Internet – Basic of internet, file transfer, telnet, usenet, gopher, wais, Archie and veronica. Introduction to Internet Protocols-, HTTP, FTP, SMTP protocols.

World Wide Web : Elements of the Web, Web browser and its architecture, The web server, the proxy server. Microsoft internet explorer, viewing pages with a browser, using a browser for Mail, News and chat, Security and Privacy issues (cookies, firewalls, Data Security, executable Applets and scripts, blocking system).

Unit – II

HTML Fundamentals: Introduction to HTML, HTML Elements, HTML Semantics, HTML 5 Doc Types, New Structure Tags, Section, Nav, Article, Aside, Header, Footer, HTML Attributes, Headings, Paragraphs, Styles, Quotations, Blocks, Classes, Layout, Iframes. Creating HTML Pages, incorporating Horizontal Rules and Graphical Elements, Hyper-links, Creating HTML Tables, Creating HTML Forms, HTML and Image Techniques, HTML and Page, Development of Website and Webpage (Planning, Navigation and Themes, Elements of a Web page, steps of creating a site, publishing and publicizing site structuring web site.

Unit–III

Cascading Style Sheets: Understanding Style Sheets, CSS Syntax and Applying Style Sheets to HTML document, Developing Style Sheets: inline, internal and external. CSS Selectors, <DIV> tag, Using class and ID, Styling Backgrounds, Styling borders, Styling Text, Styling Fonts, Styling Links, Styling Lists, Styling Tables, Margin, Flex and Grids. **Bootstrap & Web page design** : CMS, Banks of CMS, Joomla/wordpress-Installation, Design and development of websites.

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Unit–IV

Java script: Introduction to scripting language, Client Side Scripting, memory concepts, arithmetic decision making, Java script control structures, Java script functions, JS Popup Boxes, events, program modules in java script, function definitions duration of identifiers, scope rules, Controlling Programming Flow, recursion java script global functions.

Unit – V

Java script arrays: introduction, array declaring and allocating memory, passing arrays to functions, multiple subscripted arrays. The Java Script Object Model, Java Script language Objects, Developing Interactive Forms, Validation of Forms, Cookies and Java Script Security Controlling Frames in Java Script, Client – Side Java Script Custom, JavaScript Objects

References :

1. The Colete eference: HTML & XHTML; Thomas A. Powel, 4th Edn.
2. Mastering HTML 4.0 by Deborah S.Ray an Eric J. Ray From BPB
3. Mastering Java Script, BPB publication.
4. Internet and web technology by Raj Kamal, TMH Publication 2. Steven Holzner.
5. The Complete Reference Java Scripts,, Tata McGraw – Hill,3rd Edn.
6. Java Script, Don Gosselin,Vikas publications

BCA-106: Mathematics

Question Paper pattern for Main University Examination *Max Marks: 100*

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Part – III (Long answer) consists 5 questions of **twelve marks each** with one question from each unit with internal choice.

UNIT – I

Sets : Definition of sets, representation of sets, type of sets, Operations on sets, Sub sets, Power set, Universal set, Complement of a set, Union and Intersection of two sets, Venn diagrams, Principles of Inclusion and Exclusion.

Relations: Cartesian product of sets, Definition of relation, Types of relations- reflexive, symmetric, anti-symmetric, transitive , equivalence.

UNIT – II

Functions : Definition, Domain & Range of a functions, one to one and onto functions, Bijective functions, composite functions, inverse of functions. Types of functions- constant, identity, polynomial, exponential, logarithmic.

Logic and Proofs : Proposition, Conjunction, Disjunction, Negation, Compound proposition, De Morgan's laws, Tautolity and Contradiction.

UNIT - II

Matrices: Definition and Types of Matrices, Addition , Subtraction and Multiplication of Matrices, Non-commutatively of multiplication of matrices, Scalar Multiplication. Transpose of a Matrix.

Determinant: Determinant of a square matrix (up to 3x3 matrices), properties of determinants, minors , cofactors, expansion of determinants, application of determinants in finding the area of a triangle. Adjoint and Inverse of a matrix. Solution of system of linear equations by inverse matrix method and Cramer's Rule.

UNIT –IV

Statistics : Data collection methods, Data classification, Frequency Distribution. Graphical representation of frequency distribution. **Measures of Central Tendency**- Mean, Median, Mode. Measures of Dispersion- Mean Deviations, Standard Deviations. Variance and Skewness.

UNIT –V

Correlation Analysis : Correlation, Types of Correlations, Methods of Studying Correlations, Measure of Karl Pearson's coefficient of correlation. Rank Correlation Coefficient.

Regression Analysis: Regression, Use of regression analysis., Difference between Correlation and Regression Analysis, Regression Lines Equations, Properties of regression lines.

Reference Books:

1. C.L. Liu: Elements of Discrete Mathematics, Tata Mc-Graw Hill Publishing Company Ltd., 2000
2. Seymour Lipschutz; Discrete Mathematics;TMH.
3. Kenneth H Rosen; Discrete Mathemtics & Its Applications; 6 Edition,MGH;
4. Richard Johnsonbaugh: Discrete Mathematics, Pearson Education, Asia, 2001
5. John Truss: Discrete Mathematics for Computer Scientists, Pearson Education, Asia. 2001.
6. Basic Mathematics, R.D. Sharma
7. B.L. Agrawal; Basic Statistics; Khanna Pub.
8. S.P.Gupta; Statistical Methods; Sultan Chand & Sons
9. S.C.Gupta, V.K. Kapoor ; fundamental of statics; Sultan Chand & Sons

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