
# Maharaja Surajmal Brij University

## Bharatpur (Raj.)

## SYLLABUS

## BACHELOR OF

## COMPUTER APPLICATION

## BCA Part I, II & III

## (Session 2020-21)

Session 2021-22

Only For Session
2020-21

अकादमिक प्रभारी
महाराजा सूरजमल ब्रज विश्वविद्यालय
भरतपुर (राज.)

# Bachelor of Computer Applications (BCA)

**Eligibility** for Admission to BCA course session 2014-2015 "A candidate must have passed 10+2 examination (Arts/Science/Commerce) or equivalent with securing 48% or more (minimum pass mark for SC/ST/OBC/SBC candidates) in aggregate without any approximations".

In regard to reservation of Seats for admission to BCA Part I, the reservation policy of Govt. of Rajasthan/University of Rajasthan will be followed.

**Admission Procedure:** Admission to BCA Part I course will be made on the basis of merit list (10+2 level).

**Attendance:** A candidate shall be required to put in a minimum of 75% attendance at the lectures and 75% attendance at the practicals separately in each paper, as per university norms.

## Scheme of Examination for Bachelor of Computer Applications(BCA):

The Bachelor of Computer Applications will be a Three Part Course in Faculty of Science extending over three academic sessions. Medium of instructions and examination will be English only. There shall be an examination at the end of each part. Each theory paper examination will be of three hour duration and shall carry 100 marks. Theory paper shall contain three parts. All questions are compulsory.

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.

Each practical examination (Maximum marks 100) will be of four hour duration on one day and carry 60 marks for exercises(3 exercises) assigned in the examination, 25 marks for viva-voce and 15 marks for practical records and regularity of the candidate. Other rules and procedures of examinations will be common to those for B.Sc. course.

A candidate will be promoted to Part III if he/she passed with 40% in three theory and two practical papers of Part II examination and with at least 50% in aggregate of these papers. However, if the candidate has not passed Part I Examination then also he/she be promoted to part III if the number of due papers ( part I & Part II together) does not exceed four theory papers and two practical papers.

Passing of Examination and Promotion to next Part: A candidate must secure at least 40% marks in each paper and 50% marks in aggregate for passing a part examination. A

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candidate will be promoted to part II if he/she has secured at least 40% in three theory and two practical papers of part I examination and with at least 50% in aggregate of these papers. A candidate will be promoted to Part III if he/she has passed 40% in three theory and two practical papers of Part II examination and with at least 50% in aggregate of these papers, and has passed Part I examination.

Division and Honors: On successful passing out of all three part examinations (in first attempt), those securing 75% and above in aggregate of all the three parts will be awarded First division with Honors, and those securing between 60% or more but less than 75% will be awarded First division and rest will be awarded Second division.

## BCA Part - I

| Code | Subject | Hours/ Week | Max. Marks |
|---|---|---|---|
| Theory | | | |
| BCA-101 | Elementary Physics | 4 | 100 |
| BCA-102 | Basic Mathematics | 4 | 100 |
| BCA-103 | General English | 4 | 100 |
| BCA-104 | Principles of Programming Language (Through 'C') | 4 | 100 |
| BCA-105 | Computer Organization | 4 | 100 |
| BCA-106 | Office Management Tools | 4 | 100 |
| Practical | | | |
| BCA-107 | Technical Writing and Communication Skills | 3 | 100 |
| BCA-108 | C- Laboratory | 3 | 100 |
| BCA-109 | Office Automation Laboratory | 3 | 100 |
| BCA-110 | Typing Skills Laboratory ( English and Hindi Language) | 3 | 100 |

## BCA Part - II

| Code | Subject | Hours/ Week | Max. Marks |
|---|---|---|---|
| Theory | | | |
| BCA-201 | Business Accounting | 4 | 100 |
| BCA-202 | Discrete Mathematics | 4 | 100 |
| BCA-203 | Operating System | 4 | 100 |
| BCA-204 | Database Management System | 4 | 100 |
| BCA-205 | Web Designing and Multimedia | 4 | 100 |
| | Elective (Any One) | | |
| BCA-206(A) | Object Oriented Programming Concepts (Through C++) | 4 | 100 |
| BCA-206(B) | Programming through VB 6.0 | 4 | 100 |
| Practical | | | |

| | | | |
|---|---|---|---|
| BCA-207 | Database Laboratory | 3 | 100 |
| BCA-208 | Object Oriented Laboratory | 3 | 100 |
| BCA-209 | Web Designing Laboratory | 3 | 100 |
| BCA-210 | Multimedia Laboratory | 3 | 100 |

**BCA Part - III**

| Code | Subject | Hours / Week | Max. Marks |
|---|---|---|---|
| **Theory** | | | |
| BCA-301 | Data Structure (Using C/C++) | 4 | 100 |
| BCA-302 | System Design Concepts | 4 | 100 |
| BCA-303 | Networking Technologies | 4 | 100 |
| BCA-304 | Core Java Programming | 4 | 100 |
| BCA-305 | E-Commerce | | |
| | Elective (Any One) | 4 | 100 |
| BCA-306(A) | ASP.Net | 4 | 100 |
| BCA-306(B) | PHP | 4 | 100 |
| BCA-306(C) | Linux and Shell Programming | | |
| **Practical** | | | |
| BCA-307 | Networking Laboratory | 3 | 100 |
| BCA-308 | Core Java Laboratory | 3 | 100 |
| BCA-309 | Elective Laboratory | 3 | 100 |
| BCA-310 | Project | | |

## BCA Part I

## BCA101: Elementary Physics

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

Electric charge, conductors and insulators, Coulomb's Law, quantization and conservation of electric charge. the electric field, electric lines of force and Gauss' Law of electrostatics, electric potential energy, electric potential.

Capacitors, capacitance, capacitors in series and parallel, capacitors with dielectric. Electric current, resistance, Ohm's law, electromotive force, series and parallel combination of resistances, current in a single loop.

### UNIT-II

Magnetic field due to a bar magnet. magnetic field due to a current carrying coil, Force between two parallel currents, Magnetic field inside solenoid and toroid, magnetic flux, Faraday's law of electromagnetic induction, magnetic properties of matter. (diamagnetic, paramagnetic.

### UNIT-III

Introduction to Logic and implementation with Logic Gates, Logic functions- NOT,AND OR NOR, EX-NOR. Truth tables, Boolean Algebria. de Morgan's theorems, Minterms and Maxterms, Karnaugh Maps, simplification of logical functions, introduction of "don't care" states, Synthesis using only NAND or only NOR gates.

### UNIT - IV

Combinational Circuits. Multiplexer- IC 74150 and IC 44151. De multiplexer-IC 74154, Decoder IC 71139, BCD to Seven segment Decoder IC 7446/7447 IC 7448/1449 Decimal to BCD Priority Encoder- IC 7417 parity Checker IC 741 80.

### UNIT V

Sequential Circuits : RS Flip Flop. Clocked RS I lip Flop. D Flip Flop. Edge Triggered D Flip Flop, master Salve Technology and its advantage. Shift Register

**Reference Books**


1. Bernard Grob Basic Electromes. Tata M Graw Hill.
2. Fowler Electricity. Tata Mc Graw Hill.
3. Shivakumar. Ingineering Physics. Tata Mc Graw Hill.
4. Iyer Circuit Therory Tata Mc Graw Hill.
5. S Salivahanan and S Arivazhayan. Digital Circuits and Design. Vikas Publishing House Pvt.
6. RP Jain, Modern Digital Electronic, Tata Mc Graw Hill Publishing Company New Delhi.

## BCA102: Basic Mathematics

**Question Paper pattern for Main University Examination** **Mar 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

**Functions :** Functions. domain & range of a function, types of functions constant, identity, polynomial, exponential, logarithmic. trigonometric, inverse-trigonometric, rational, periodic, modulus, signum.

Function domain and range, one to one and onto functions, composite functions, inverse of functions, Binary operations.

### UNIT - II

**Matrices and Determinant :** Definition and Types of Matrices, Addition , Subtraction and Multiplication of Matrices, Non-commutatively of multiplication of matrices and existence of non-zero matrices whose product is the zero, matrix(restrict to square matrices of order 2), Scalar Multiplication. Transpose of a Matrix.

Determinant of a square matrix (up to 3x3 matrices), properties of determinants, minors cofactors. expansion of determinants.

### UNIT- III

**Co-ordinate Geometry :** Cartesian co-ordinate system, Polar coordinate system, distance between two points, section formulae, Area of a triangle, Locus and its Equation. Straight Line- Equation of straight line. slope form, two point form, intercept form, normal form, distance of a point from a line, condition of concurrency of three lines.

**Quadratic Equation:** Solution of Quadratic Equations, Nature of Roots. Relation between the roots of a quadratic equation, formation of quadratic equation from given roots.

### UNIT-IV

**Statistics :** Frequency Distribution, Graphical representation of frequency distribution. Mean, Median. Mode and other measures of Central Tendency, Dispersion, Standard Deviations, Variance. Correlation and regression.

## UNIT-V

**Probability:** Factorial notation n!, Combinations and Permutations, Classical approach of Probability-trial & events, exhaustive events, equally likely events, mutually exclusive events, favourable events, independent events. Classical or mathematical definition of probability. Law of addition of probabilities. Multiplication law of probability and conditional probability.

**Reference Books:**


1. CL Line Elements of Discrete Mathematics. Tata Mc-Graw Hill, Publishing Company Ltd., 2000
2. Seymour Lipschutz: Discrete Mathematics:TMH.
3. Richard Johnsonbaugh. Discrete Mathematics, Pearson Education, Asia, 2001
4. John Truss: Discrete Mathematics for Computer Scientists, Pearson Education, Asia. 2001.
5. Basic Mathematics, R.D. Sharma
6. B.L. Agrawal, Basic Statistics, Khanna Pub.
7. Stephen Bernstem: Fiements of Statistics, TMH.
8. SC Gupta, VK Kapoor, Fundamental of Statics Sultan Chand & Sons.

## BCA 103: General English

**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

**Concepts and Fundamentals :** Narration. Active and Passive Modals. Subject Verb Concord. Subordination. Coordinations Meaning of communication. Importance of communication. Communication scope Process of communication, Communication models and theories, Essentials of communication - The Seven Cs of communication.

### UNIT-II

**Written Communication :** Objectives of written Communication, Merits and demerits of written communication, Planning business messages.

**Writing Letters :** Business letters. Good news and bad news letters, Persuasive letters, Sales letters, Letter styles/layout.

### UNIT-III

**Report Writing :** Meaning & Definition, Drafting the report, Layout of the report, Essential requirement of good report writing.

**Language Skills :** Improving command in English, Common problems with verbs, adjectives. adverbs. pronouns, conjunctions, punctuation

### UNIT-IV

**Oral Communication :** Principles of effective oral communication, Advantages of oral communication, Disadvantages of oral communication.

**Interviews :** Meaning & Purpose, Art of interviewing. Types of interview, Interview styles, Essential Features, Structure, Guidelines for Interviewer, Guide lines for interviewee.

**Arts of Listening :** Good listening for improved communications: Art of listening, Meaning, nature and importance of listening.

## UNIT-V

**Job Application :** Types of application, Form & Content of an application, Drafting the application, Preparation of resume.

**Project Presentations :** Advantages & Disadvantages. Executive Summary, Charts, Distribution of time (presentation, questions & answers. Summing up). Visual presentation. Guidelines for using visual aids. Electronic media (power-point presentation).

**Recommended Books**

1.. Communication in C.S. Rayuda Himalaya Publishing House.

2. Communication Today-tinderstanding (reative Skill by Reuben Ray, Himalaya Publishing houses
3. Successful Communication by Malra Treece.
4. Business Communication Today by Bovee & Thill, McGraw Hill
5. Communication kills and report writing by Prof. K. Mohan etc., Tata Macgraw Hill.

## BCA 104: Principles of Programming (Through 'C')

Question Paper pattern for Main University Examination 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

Basic concepts of Pr gramming languages, Programming Domains, Language Evaluation criteria and language categories, Evolution of major programming languages.

### UNIT- II

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

### UNIT-III

Iteration: while, do. while, for loop, nested loops, break & continue, goto statements. Arrays and Strings: One-dimensional arrays and their declaration and initialization, two-dimensional arrays and their initializations. character arrays (One and two dimensional), reading and writing strings.

### UNIT-IV

Functions: Need and elements for user defined functions, definition of functions, retum 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. Understand g Pointers: Accessing the address of a variable, declaration and initialization of pointer variables, accessing a variable through its pointer.

### UNIT V

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

EO in C Formatted and Un-Formatted EO, file handling (Random, Binars and Sequential)

**Recommended Books:**

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

## BCA105: Computer Organization

Question Paper pattern for Main University Examination 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

Computer System History and Architecture development von Neumann machine, Mother Board, System clock, Bus (Data, Address Control), Bus architecture (ISA, MCA, EISA, PCI, AGP), Expansion slots and cards (Network adapter cards. SCSI card, Sound card, TV tuner card, PC card). Ports (Serial Parallel, AGP. USB Fire Wire), cables (RS 232. BIN) Input devices Output devices. Storage devices, random versus sequential access formatting, tracks and sectors, speed, storage capacity, Floppy Disk, Hard Disk tracks, Cylinders, sectors.

### UNIT-II

Basic building blocks - I/O Memory, ALU and its components, Control Unit and its functions. Instruction - word. Instruction and Execution cycle, branch, skip jump and shift instruction, Operation of control registers; Controlling of arithmetic operations.

### UNIT-III

Basics of Computer organization system buses and instructions cycles, memory subsystem organization system buses and instruction cycles, memory subsystem organization and interfacing. I/O subsystem organizations and interfacing Register transfer languages. CPU design specifying a CPU. design and implementation of a simple CPI (fetching instructions from memory, decoding and executing instructions. establishing required data paths.

### UNIT-IV

Addressing technique. Direct, Indirect. Immediate. Relative, Indexed addressing and paging. Register Indexed. General purpose. Special purpose, overflow, cure, shift scratch. Memory Buffer register; accumulators, stack pointers, floating point; status information and buffer registers.

### UNIT V

Buses. Interfacing buses, Bus formats - address, data and control, Interfacing keyboard, display, auxiliary storage devices and printers. I/O cards in personal computers. Introduction to 8085 microprocessor, Difference between microprocessor and microcontrollers, RISC v/s CISC.

**Recommended Book-**


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

## BCA106: Office Management Tools

Question Paper pattern for Main University Examination 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 Maxim.. n 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 Operating System:** Introduction to Operating system, FAT and NT file systems, file and directory structures and naming rules of files, booting process system files. Dos commands (internal & external)

Windows 7/8. Windows concept, features. Desktop. Taskbar. Start menu. My Computer Recycle bin. Windows Accessories Calculator. Notepad. Paint. Word Pad. Character Map. W .ndows Explorer. Entertainment System Tools.

### UNIT-II

MS Word: Word processing. MS Word lectures. 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.

### UNIT-III

**MS Excel:** Worksheet basics, creating worksheet, entering data into worksheet, data, text, dates, alp! anumeric, 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, absolute and relative addressing, formatting of worksheet, previewing & printing worksheet, Graphs and Charts, Database, macros, multiple worksheets-concepts.

### UNIT-IV

**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 design: ıdding graphics.

### UNIT-V

Microsoft Access: Planning a database (tables, queries, forms, reports), creating and editing database, customizing tables. linking tables, designing and using forms.

**Reference Books:**


1. Microsoft; 2007/2010 Microsoft Office System, PHI.
2. Microsoft; Microsoft Office 2007/2010: Plain & Simple: PHI.
3. Microsoft; Microsoft Office XP: Plain & Simple; PHI.
4. Sanjay Saxena; A First Course in Computers 2003 Edition: Vikas Pub.


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## BCA Part - II

## BCA201: Business Accounting

**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

**Basics of Bookkeeping and Accounting :** Financial Accounting - Definition Scope and Objective of Financial Accounting. Limitations of Financial Accounting. Financial Accounting Principles.

### UNIT-II

**System of Bookkeeping :** Accounting Process, Double Entry System, Books of Prime Entry, Subsidiary Books.

### UNIT-III

**Ledger Accounts** - Preparation of Ledger Accounts, Bank Reconciliation Statements, Preparation of Trial Balance & Balance Sheet.

**Depreciation Accounting** - Meaning, need and importance of depreciation,

### UNIT-IV

**Final Accounts :** Opening and Closing Entries, Trading, Profit and Loss accounts and Balance Sheet

### UNIT-V

**Final Accounts with Adjustments :** Adjustments of Dividends, Drawings, Outstanding incomes and expenses, Depreciation.

**Recommended Reference Books :**

1. Shukla & Grewal : Advanced Accounts.
2. Sharma, Shah, Agrawal : Financial Accounting.
3. Rajesh Agrawal & R. Srinivasan.: Accounting Made Easy (Tata McGraw-Hill)

## BCA Part - II

## BCA202 : Discrete Mathematics

Question Paper pattern for Main University Examination Mac 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 - 11 (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

**Number Systems: Number systems**- natural numbers, integers, rational numbers, real numbers, complex numbers, arithmetic modulo a positive integer. Radix r representation ( decimal and binary), Change of radix( decimal to binary and vice versa). Binomial Theorem and Mathematical Induction:: Binomial theorem for positive integral indices, general and middle term in binomial expansion with simple applications. Some simple problems of Principle of Mathematical induction.

**Recurrence Relations and Generating Functions :** Recurrence relation, linear recurrence relation with constant coefficients, solution of linear recurrence relation with constant coefficients. Generating functions, Solution of recurrence relations using generating functions.

### UNIT-II

**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, De-Morgans law of sets, Partition of sets

**Relations:** Relation, ypes of relations- reflexive, symmetric, anti-symmetric, transitive, equivalence and partial order relation. Relation and diagraphs, Cartesian product of two sets. Functions: Function, domain and range, One to one and onto functions, composite functions, inverse of a functions. Binary operations.

### UNIT - III

**Logie and Proufs :** Proposition, Conjunction, Disjunction, Negation, Compound proposition, Conditional propositions (Hypothesis, conclusion, necessary and sufficient condition) and Logical equivalence, Do Morgan's law, Tautology and contradiction, quantifiers, universally quantified statements, component of a Mathematical systemi 'axiom, definitions, undefined terms, theorem, lema and corollary), proofs (direct proofs, indirect proofs, proof by contra-positive), Mathematical Induction.

## UNIT - IV

**Graph:** Basic terminology, directed and undirected graphs, path and connectivity, types of graphsNull, Regular, Complementary, Complete, Weighted and Bipartite. Subgraphs. Representation of graphs in computer memory matrix representation)- Adjacency matrix, Incidence matrix Fusion of graphs. Isomorphic and Homeomorphic graphs, paths and cycles, Eulerian and Hamiltonian graphs, shortest path algorithm.

## UNIT - V

**Tree :** Definition of tree, Fundamental terminologies-Node, Child, Parent, Root, Leaf Level Height and Subling. Rooted trees, Ordered trees, Binary trce, Complete binary tree, Tree of an algebraic expression, Tree searching ( traversal algorithms). Preorder, Inorder and Postorder Distance and centre, Relation between general tree and binary tree, Spanning trees, Algorithms for minimal spanning trees (Kruskal's and Prim's).

**Recommended reference books :**


1. C.I.Liu: elements of Discrete Mathematics Cata McGraw Hill publishing Company Ltd. 2000
2. Richard johnsonbaugh disvrete mathematics prearson Asia 2001
3. John Truss: Discrete Mathematics for Computer Scientists, Pearson Education, Asia, 2001.
4. Robert J. McEliece: Introduction to Discrete Mathematics, Tata Mc. Graw Hill, India.
5. Lipschutz: Discrete Mathematics, Tata Mc. Graw Hill India.
6. Kenneth H. Rosen, Discrete mathematics and Applications, Tata Mc. Graw Hill, India.

## BCA203 : Operating System

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

Necessity of Operating system. Operating system terminology, Evolution of Operating Systems (multiprogramming systems, batch systeins, timesharing system, Process control and Real-time system). Factors in OS Design (performance protection and security, correctness, maintainability application integration, portability, and interoperability).

### UNIT - II

Process Management: Process definition, Process control, initializing Operating System, Process Address Spaces Process Abstraction; resource Abstraction and Process Hierarchy. Scheduling Mechanisms, Partitioning a process into small processes Non-preemptive strategies (first come first served, shortest job next, priority scheduling deadline scheduling), Preemptive strategies (Round Robin). Basic Synchronization principles : Interactive processes coordinating processes. Semaphores. Shared memory multiprocessors, AND Synchronization, Inter process communication, inter process messages,

Deadlocks. Resource Status Modeling Handling deadlocks.

### UNIT - III

**Memory Management:** Requirements on the primary memory, mapping the address space to primary memory, dynamic memory for data structures, Memory allocation (Fixed partition Memory allocation strategy), Dynamic Address Relocation, Memory langer Strategies (Swapping. Virtual Memory. Shared Memory Multiprocessors). Virtual Memory: Address translation paging, Static and dynamic paging algorithms.

### UNIT - IV

Structured files, Memory mapped files. Directories, directory implementation, file sharing information across network remote-Viruses and Worms. Security Design principles.

### UNIT-V

Protection an Security goals, Domain of Protections, Security Problems, Authentication, Syste threats, Encryptions, Introduction of different Operating systems (Linux, Unix, Windows Server).

**Recommended reference books:**


1. Galvin P.B, Silberschatz; Operating System Principles; ( Seventh Edition), J Wiley 2008
2. Tanenbaum A.S, Modern Operating Systems, 2nd Edn. PHI Publ.2003
3. William Stalling: Operating Systems, Internal & Design Principles, Sixth Edn; Pearson, 2009.
4. Gary Nutt: Operating Systems-A Modern Perspective (Second Edition), Pearson Education 2008.
5. D.M. Dhandlere: Systems Programming and Operating Systems (Second Edition), Tata McGraw Hill Publishing company Limited.
6. Harvey M. Deitel, Operating Systems, Pearson Education.


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## BCA204: Data base Management System

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

**Database System Concepts & Architecture:** Overview of DBMS, Basic DBMS terminology, data base system vis file system, Advantages and disadvantages of DBMS, Codd rules, data independence. Architecture of a DBMS, Schemas, Instances, Database Languages.

### UNIT-II

**Data Modeling:** Data modeling using the Entity Relationship Model: ER model concepts notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key. primary key.

**Relational Algebra:** Fundamental operations of relational algebra & their implementation, interdependence of operations.

### UNIT-III

**Database Design:** Functional dependencies, loss less decomposition, 1st, 2nd & 3 normal forms dependency preservation, boyce codd NF. Introduction to Transactions, transaction states.

### UNIT-IV

**Introduction to SQL:** Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, views and indexes, Queries and sub queries, Aggregate functions, insert, update and delete operations. Joins, Unions, Intersection, Minus in SQL.

### UNIT- V

**Introduction to Advance DBMS :** Object Oriented Languages, Persistent Programming Languages. Object-Relational Databases: Nested Relations, Storage for Object Databases.

**Distributed Databases :** Distributed Data Storage, Distributed Transactions, Commit protocol.

**Reference Books:**


1. Korth H F and Silberschataz A, System Concepts, Sixth Edition; McGraw Hill,2006
2. Leon, and Leon, SQL Tata McGraw Hill Pub. Co. Ltd.
3. Ivan Bayross; SQL/PL 4th Edn: BPB,2009
4. Navathe S.B. Elmasri R; Fundamentals of Database Systems, Fifth Edition, Pearson 2009.
5. Ramakrishan and Gharke, Database Management Systems, 3rd Edition, Tata Mc Graw Hill, 200
6. Data C.J. Database Management Systems, Pearson Education Asia.
7. Singh S.K.; Database Systems; I Edition; Pearson, 2006.


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## BCA205 : Web Designing and Multimedia

Question Paper pattern for Main University Examination Mar 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

**World Wide Web:** Elements of the Web, Web browser and its types, viewing pages with a browser, using a browser for Mail, News and chat, Security and Privacy issues (cookies, firewalls, executable Applets and Scripts, blocking system). Plug-Ins and Active controls, dealing with Web pages that contain Active X, playing streaming Audio and Video, playing MP music. Using Search engines, subscriptions and channels, making use of web resources (Portal, News and weather, sports Personal)

### UNIT- II

**HTML Fundamentals:** Introduction to HTML, Creating HTML Pages, incorporating Horizontal Rules and Graphical Elements, Hyper-links, Creating HTML Tables, Creating FITML Forins, HTML and Image Techniques. HTML and Page, Frames, publishing and publicizing site structuring web site.

### UNIT-III

**Introduction to DHTML:** features of DHTML, CSS: Types of Style sheets, Different elements of Style sheets, Filter effects, IFrame, DIV and Layer Tags.

### UNIT-IV

**Java Script Fundamental:** Introduction to Java Script Working with Variables and Data Functions, Methods and Events, Controlling Programming Flow. The Java Script Object Model Java Script language Objects, Developing Interactive Forms.

### UNIT-V

**Introduction of Photoshop**

**Creating a New File:** Main Selections, Picking color, Filling a selection with color, More ways to choose colors and fill selections, Painting with paintbrush tool, Using the magic wand tool ar applying a filter, Saving your document (save your file;- Save file as a JPEG, TIFF, GIF, PNG), Introduction and use of layers, Introduction and use of tool of PhotoShop.

**References:**


1. Mastering HTML 5.0 by Deborah S. Ray an Eric ). Ray From BPB.
2. Mastering Java Script, BPB publication.
3. Black book Photosh op.
4. Blackbook CoralDraw.
5. M.L. Young: Complete Reference b: Internet:2nd Edition; Tata McGraw Hill, 2006.
6. Thomas A; Powel. Web Design: C.R.: Second Edition TMH 2009.
7. Thomas A. Powel HTML & XHTML: C.R. Fourth Edition, TMH, 2008.
8. G. Roverston; Hands on HITML., BPB Publication.
9. Joel Sklar: Principles of Web Design BPB Publication.




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## BCA206 (A) . Object Oriented Concepts (Through 'C++')

Question Paper pattern for Main University Examination Mar 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 Object Oriented Concepts:** Evolution of OOP, OOP Paradigm advantages of OOP, comparison between functional programming and OOP approach. characteristics of object oriented language - objects, classes, inheritance, reusability, user defined data types, polymorphism, overloading.

### UNIT -II

**Introduction to C++:** C++ tokens, data types, CH operators, type conversion, variable declaration, arrays.

### UNIT - III

**Classes and Objects:** Classes, objects, defining member functions, arrays of class objects, pointers and classes, passing objects, constructors, types of constructors, destructors, this pointer, access specifiers, friend functions, inline functions.

### UNIT - IV

**Inheritance:** Introduction, Importance of Inheritance, types of inheritance, Constructor and Destructor in derived classes.

**Polymorphism:** Function overloading, operator overloading, virtual functions, pure virtual functions

### UNIT-V

Operations on Files. Templates, Exception Handling.

**Reference Books :**


1. Herbert Schildt; CH: The Complete Reference 4th Edn; TMH, 2003.
2. Robert Lafore; Object Oriented Programming in C++, 4th Edition; Techmedia.
3. Balagurusamy : Object Oriented Programming in C++, 4th Edition TMH,2009.
4. Venugopal, Rajkumar; Mastering C++, Tata Mcgrow Hill, 2006.
5. Kanetkar Y.: LET [illegible] S C++; BPB, 2009.
6. Deitel and deitel; How to program C++, Addison Wesley, Pearson Education Aisa
7. John R. Hubbard, Programming with C++, McGraw Hill International.

## BCA206 (B): Programming through VB 6.0

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 :** Introduction Graphical User Interface (GUI), Programming Language (Procedural. Object Oriented, Event Driven), The Visual Basic Environment, Editions of Visual Basic, Features of VB, How to use VB complier, debug and run the programs, Introduction to tool box, object naming conventions, setting properties, Methods and Events. Working with basic objects - forms, labels, textboxes, command buttons, option button, check box, Frame and Image.

### UNIT -II

**Programming Fundamentals :** Data types in VB, Variables and Declaration, Scope of variables. Operators in VB, sub procedures and functions, Control structures - IF, Select ..case, Do while ... loop, Do ... loop while, Do ... loop until, For .Next, Exit For. Do, With .. End With. Fixed size and Dynamic Arrays, control array, Data type conversion functions, VB Built in functions - Date, time, Format and String.

### UNIT - III

**Additional Controls and Menus :** List box and combo box controls, Scroll bars, Picture box control, Shape and line controls, Timer control, Menu basics, Menu Editor, Creating menus, Assigning access keys and short cuts, Separating menu items, creating popup menus, controlling menus at run time.

### UNIT-IV

**Dialog Boxes, Mouse Events, MDI Forms and Error Handling :** Standard, Custom and Common Dialog Control and Mouse Events, Creating and using MDI Form, Arranging the child forms, Adjusting the size of controls, Runtime errors, Handling runtime errors by on error .. Statements, Ent object, Debug and immediate window.

### UNIT-V

**Database Connectivity :** Connecting with databases through ADODC control, Bounded and unbounded methods for displaying data, Accessing and Navigating database, Recordsets - Tabletype, Dynaset, snapshot, dynamic and forward only, connecting database using connection string.

**Reference Books :**

1. Petroutsos Evangelos: Mastering Visual Basic 6.0; BRB Publications, 2002.
2. Norton's Peter: Guide to Visual Basic 6.0; Techmedia.
3. Kurata Deborah: Doing Objects in Visual Basi; Techmedia.
4. Mastering database Programming with Visual Basic 6 by Petroutsos.

BCA Part - III

BCA301 : Data Structure (Using C/C++)

Question Paper pattern for Main University Examination Mar 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 Design:** Algorithm, analyzing Algorithms and problems.

**Linear Structure:** Arrays, records, stack, operation on stack, implementation of stack as an array, queue, types of queues, operations on queue, implementation of queue.

## UNIT-II

**Linked Structure :** List representation, Polish notations, operations on linked list - get node and free node operation, implementing the list operation, inserting into an ordered linked list, deleting, circular linked list, doubly linked list.

## UNIT- III

**Tree Structure :** Concept and terminology, Types of trees, Binary search tree, inserting, deleting and searching into binary search tree, implementing the insert, search and delete algorithms, tree traversals , Huffman's algorithm.

## UNIT - IV

**Graph Structure :** Adjacency list, Warshall's algorithm , adjacency multilist representation. Orthogonal representation of graph. Graph traversals - bfs and dfs. Shortest path, all pairs of shortest paths.

## UNIT-V

**Searching and sorting :** Searching - Sequential searching, binary searching, hashing. Sorting - selection sort, bubble sort, quick sort, heap sort, merge sort, and insertion sort, efficiency considerations.

**Recommended reference books :**


1. S. Lipschutz: Data Structures; Mc Graw Hill International Edition 2008.
2. A.V. Aho, J.E. Hopcroft, and J.D. Ullman, Data Structures and Algorithms, 314 Edition; Pearson Education Asia, 2008
3. Salaria R.S.: Data Structure and Algorithms Using C/C++; 4th Edition; Khanna.
4. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data structures with applications TMH Publishing Co.Ltd.
5. A. Michael Berman: Data Structures via C++ Oxford University Press.
6. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data Structures with application, TMH Publishing Co. Ltd.

## BCA302 : System Design Concepts

Question Paper pattern for Main University Examination Mar 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 Systems Design Environment:** Systems Development Approaches-Function Oriented. Data Oriented, Object Oriented, Development Process, Methodologies, Tools, Modeling Methods, Processing Types and Systems, Batch Processing, Realtime Processing.

System Development Life Cycle, Linear or Waterfall Cycle, Linear cycle phase problem definition, system specification, system design, system development, testing, maintenance Problems with Linear Life Cycle, Iterative Cycles, Spiral model Requirements analysis, Importance of Communication, Identifying Requirements, Data and Fact Gathering Techniques, Feasibility Studies, Introduction to Prototyping, Rapid Prototyping Tools, Benefits of prototyping.

### UNIT -II

System Design: Interface design tools, user interface evaluations, Introduction to Process Modeling, Introduction to Data Modeling.

System Design Techniques, Document Flow Diagrams, Documents, Physical Movement of documents, Usefulness of Document Flow diagram, Data Flow Diagrams, DFD notation, Context diagram DFD leveling, Process descriptions structured English, Decision Trees and Decision Tables, Entity Relationship Diagrams, Entities, Attributes, Relationship, Degree, Optionality, Resolving many to many relationship, Exclusive relationship, Structure Charts, Modules, Parameter passing. Execution sequence, Structured Design, Conversion from Data Flow Diagrams to Structure Charts.

### UNIT - III

Testing fundamentals: Objectives, principles, testability, Test cases: White box & Black box testing strategies: verification & validation, UNIT test, integration testing, validation, testing, system testing, System Implementation, Maintenance and documentation.

### UNIT -IV

S/W Project planning Objectives, Decomposition techniques : S/W Sizing, Problem-based estimation Process based estimation, Cost Estimation Models : COCOMO Model, S/W Design.

## UNIT - V

**An overview of Management Information System:** Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS : Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Un-struciured decisions, Formal Vs. Informal systems.

Developing Information Systems.

**References:**


1. Igor Hawryszkiewyez, Introduction to System Analysis and Design, 4th edition, Prentice-Hall.
2. Jeffrey L. Whitten, and Lonnie D. Bentey, Systems analysis and Design Methods 4th edition, Tata McGraw-Hill.
3. Roger, S. Pressman, "Software Engineering-A Practitioner's Approach", Third Edition, McGraw Hill
4. R.E. Fairley, 'Software Engineering Concepts", McGraw Hill
5. J. Kanter, "Management/Information Systems". PHI.
6. Jalota "An Integrated Approach to Software Engineering", Narosa Publishing House.
7. Gordon B. Davis & M.H. Olson." Management Information Systems : Conceptual Foundation, structure & Development."

## BCA303 : Networking Technologies

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

Network architecture, configuring network, network strategies, networks types, LAN, MAN and WAN [Basic concepts, Line configurations topology, transmission mode, identify key components of network, categories of network, differentiating between LAN, MAN, WANS and Internet).

### UNIT - II

The OSI model. The physical layer (bandwidth limited signals, transmission media, wireless transmission), the data link layer, error detection and correction, data link protocols, Bridges, the network layerm routing algorithm, congestion control algorithm, internet working, the transport layer, the application layer, MAC protocols for high speeds LANS.

### UNIT-III

Introduction to TCP/IP (Understand the TCP/IP Protocol Suite, its history and modification processe compare TCP/IP to the Open Systems Interconnection (OSI) reference model. Examine a number of TCP/IP applications such as FTP, Telnet, DNS, DHCP, Boot. etc. connection less Internetworking, IP, IPv6, IP multicasting. Routing protocols, TCP, UDP. SNMP, SMTP and MIME, HTTP.

### UNIT-IV

**Circuit Switching:** Simple switching Network, Circuit Switching Networks, Brief idea of following (detail working) not required.

**Circuit Switching Concepts:** Space Division switching, Time Division Multiplexing, Routing in circuit switching Networks, Control Signalling, Inchannel & commonchannel signaling.

### UNIT-V

Data Communication Systems, Serial Data formats. encoded data formats, error detection and correction) Information about microwave.

**Recommended Books :**


1. William Stallings: Data & Communications, Sixth Edition
2. A. S. Tanenbaum : Computer Networks
3. Behrouz A Foruzan, Data Communication and Networking; 3 Edition; Tata McGraw Hill. 2004

## BCA304 : Core Java Programming

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 10 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

Overview of Object Oriented Concepts in Java.

**Introduction:** getting and installing the Java Development Kit, Java features like security, portability, byte code, java virtual machine, object oriented, robust, multithreading, architectural neutral, distributed and dynamic, Java programming language structure and syntax, control statements (The If statement, Logical Operators, The Conditional Operator, the Switch Statement, Variable Scop, Loops).

### UNIT - II

Java arrays, Java Strings, Operations on Strings and String Buffer Objects, Class, Objects, Methods and Problem solving using classes, objects and relationships. Inheritance, types of Inheritance.

### UNIT -III

Java utilities like java.lang, java.util, java.io, GUI in Java using AWT and Swing, Event Handling Mechanisms, AWT based effective GUI in Java : Detailed overview of AWT classes, Graphics primitives and UI Components, Layout features, Standalone GUI applications. Layout Managers.

### UNIT - IV

**Applets :** Introduction to Applet coding, Applet life cycle, Graphis facility, Coler and Font, Passing parameters to applets, Apletcontext, Inter Applet Communication. Threading in Java : Fundamentals of Multi-threading Java coding with Thread classes, thread Management in Java, Implicit wait, Using Runnable interface, Thread Management in fava. Implicit wait, Using Runnable interface.

### UNIT-V

Overview of Networking in Java : URL class and its usage through connection, Sockets based connectivity, TCP/IP Sockets and server sockets.

**References :**


1. Patrick Naughton, Herbert Schildt :, Java, The Complete Reference : 7th Edition.
2. E. Balagurusamy: Programming with Java- Tata McGrawHill Publishers. II Edition
3. Khalid A. Mughal, Rolf W. Rasmussen; A Programmer's Guide to Java Certification (2nd Edn.).
4. Cay. S Horstmann, Gary Cornell; Core Java Vol I & II; The Sun Micro Systems Press.
5. Ken Arnold, James Gosling: Core Java Fundamentals( Volume I and Volume 2). 2nd Edition-, Addison Wesley.
6. Kathy Sierra, Head first Java, 2nd Edition, Orielly.
7. Bruce Eckel: Thinking in Java, 4th Edition.

## BCA305: E-Commerce

Question Paper pattern for Main University Examination 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 Electronic Commerce** : Definition of Electronic Commerce, The scope of Electronic Commerce.

**Business Strategy in an Electronic Commerce :** The value chain, Competitive advantage, Business Strategy. Business to Business Electronic Commerce : Inter-organizational transactions, Electronic mnarkets, Electronic data interchange (EDI), EDI: the nuts and bolts, EDI and Business Inter organizational E-Commerce.

### UNIT- II

**Designing (Technical, Detailed, High Level):** Introduction to Technical Design and Construction. A Client Server Model of E-Commerce, Understanding Technical Design, Construction. Introduction to Detail Design, High-Level Design, Performing High-Level Design, High Level design of Business transactions. Applying High-Level design with example.

### UNIT - III

Testing & Implementation: Introduction to Testing, Understanding Testing, Applying Testing. Challenges and Opportunities in Applying Verification and Validation.

### UNIT - IV

**Electronic Payment Systems:** Special features required in payment systems, Types of E-payment systems E-Cash E-cheque. credit card, Smart Card, Electronic Purses, E-Marketing, E-Customer Relationship Management, E-Supply Chain Management. Security Issues in E-Commerce: Security risk of E-Commerce, Types of threats, Security tuols and risk management approach. Business Ethich.

### UNIT-V

**Introduction to M-Commerce:** Business using smart devices (Mobile, e-wallet, online shopping and payment system via mobile, security and privacy features), Mobile delivery technology, applications of M Commerce. M Wallet, Mobile Shopping.

**References :**


1. P.T. Joseph, E-Commerce: A Managerial Perspective, PHI,2002.
2. Ravi Kalakota & A.B. Whinston, Frontiers of electronic Commerce Pearson Education.
3. Ravi Kalakota & A.B. Whinston, electronic Commerce-A Manager's Guide, Pearson Education
4. Agarwala Kamlesh, N and Agarwala Deeksha, Business on the Net Introduction to the Ecom., Macmillan India.
5. Bharat Bhaskar , Electronic Commerce - Framework Technologies and Application Tata McGraw Hill.


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Session 2021-22

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# BCA306(A): ASP.NET

Questing 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 .Net framework:** Managed Code and the CLR Intermediate Language.
The Framework Class Library: .Net Objects- ASP.NET.
Elements: Variable and Constants data types, declaration, Operators, types precedence, Decision statements, Loop statements.

## UNIT-II

**Types:** Structures, Enumerations, arrays.
**Windows Programming:** Creating Window forms windows controls, Button, Check box, Combo box, Label, List box Radio Button, Text box, mousemove.
**Menus and Dialog Boxes:** Creating menus, menu items, show dialog () method.

## UNIT-III

**ADO.NET:** Architecture of ADO.NET, ADO.NET providers, Connection, Command, Dataset, Accessing Data with Data set, Create an ADO.NET Application.

## UNIT-IV

**ASP.NET Features:** Application of States and Structure: Change the Home Directory in IIS- Add a Virtual Directory in IIS. Server security and application security issues.

## UNIT-V

**Creating Web Controls:** Web Controls, HTML Controls, Using Input Validation Controls, Selecting Controls for Application, Data Controls.
**Creating Web Forms:** Server Controls, State Management- Types and Application, Adding ASP.NET code to a page.
**Web Services and WCF:** Introduction to Web Services protocol and standard WSDL Documents- Visual Studio .NET Architecture of WCF.

**Reference Book:**


1. Mathew Mac Donald: Beginning ASP.NET 4.0 in C#2010, 3rd Edition, A pres.
2. Bill Evjen Scott Hanselman, Devin Rader, Professional ASP.NET4, 2010, Willey.

3. George Shepherd: Microsoft ASP.NET Step by Step, 2010 Microsoft Press.
4. Imar Spaanjaars: Beginning ASP.NET 4: in C# and VB (Wrox Programming to Programmer), 2010 Wiely Publishing.
5. Steven Holzner: ASP.NET 4.0 (Cover C# & VB) Black Book: Dreamtech Press
6. Steven Holzner: .NET Programming Black Book, Dreamtech Press.

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# BCA306(B): PHP

Questing 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 PHP:** Server side Scripting Vs Client Side Scripting, Features of PHP, Basic Syntax, Variable and constant, Data types.

## UNIT-II

**Decision Making:** If, Multiple Ifs, Nested Ifs, Loops (while, do….while, for loop, foreach), Jumping Statement.
**Arrays:** Multidimensional Arrays

## UNIT-III

**Strings:** Creating and accessing String, Searching & Replacing String, Pattern matching, splitting a string with a Regular Expression
**Functions:** Calling a Function, Parameter passing, Returning value from function

## UNIT-IV

**Form Data Handling:** $_GET, $_POST, $_REQUEST Variables, URL encryption and security functions.
**Exception Handling:** Understanding Exception and error, Try, catch, throw

## UNIT-V

**File Handling:** Opening and closing a file, Copying a file
**Database Handling:** Connection with MySql Database or ODBC, Performing basic database operation (Insert, Delete, Update, Select).

**Reference/Text Books:**

1. PHP, The Complete Reference, Steven Holzner, TMH
2. Beginning PHP 5.3, Matt Doyle, John Wiley & Sons

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Session 2021-22

# BCA306 (C): Linux and Shell Programming

Questing 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

**The Operating System:** Linux features, Linux's relationship to Unix, Overview of Linux architecture, Installation, Login and Shutdown Process, controlling processes, Introduction to Linux Security.

## UNIT-II

**The Linux File System:** Basic Principles, Pathnames, Mounting and Un-mounting File Systems, Different File Types, Directory Structure, Check and Repair File Systems Security.

## UNIT-III

Filter-The grep family, advanced filters-sed and awk vi editor: General startup of vi editor and its modes, features of vi, cursor movement insertion, deletion searching, yank put, delete commands reading & writing files.

## UNIT-IV

Shell: introduction to types of shell, the command line, standard input and standard output, filters special characters for searching files and pathnames.

## UNIT-V

Shell programming shell Meta character local and global shell variables - looping and making choice- for loop, case, while and until, shell functions eval.

**Recommended reference/Text Books:**


1. Beginning Linux Programming, N. Mathew, R. Stones, Wrox, Wiley India Ed.
2. Richard Petersen, The Complete Reference Linux, Tata McGraw Hill.
3. Sumitabha Das, Unix Concepts & Applications, Tata McGraw Hill.
4. Yashavant P. Kanetkar, Shell Programming.
5. Linux System Programming, Robot Love, O'Reilly, SPD.
6. Vijay Shekhar, Red Hat Linux-study guide, firewall media.


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