BCA Syllabus-I Year

Bachelor of Computer Application (BCA)

SBIT

ENGINEERING TOMORROW

Shri Balwant Institute of Technology

NCR Delhi, Sonepat

Approved by AICTE, Min. of HRD, Govt. of India and DTE, Govt. of Haryana

Affiliated to DCR University of Science & Technology, Murthal, Sonepat

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY, MURTHAL SONEPAT) HARYANA

REGULAR COURSE (SCHEME AND SYLLABUS)

BACHELOR OF COMPUTER APPLICATION (BCA)

SESSION 2011-12

SEMESTER-I

S.No.	Paper Code	Title of Paper	L	T	P	Sessional	Theory	Practical	Total	Credit
1	BCA-101	Mathematical Foundation	3	1	-	50	100	-	150	4
2	BCA-103	Digital Electronics	3	1	-	50	100	-	150	4
3	BCA-105	Computer Fundamentals & Application Tools	3	1	-	50	100	-	150	4
4	BCA-107	Communication Skills-I	3	1	-	50	100	-	150	4
5	BCA-125	Software Lab-I (Based on BCA-105)	-	-	3	50	-	50	100	3
6	BCA-129	Seminar	-	-	-	100	-	-	100	1
Total			**12**	**4**	**3**	**350**	**400**	**50**	**800**	**20**

SEMESTER-II

S.No.	Paper Code	Title of Paper	L	T	P	Sessional	Theory	Practical	Total	Credit
1	BCA-102	Introduction to Information Technology	3	1	-	50	100	-	150	4
2	BCA-104	Discrete Mathematics	3	1	-	50	100	-	150	4
3	BCA-106	Programming in C	3	1	-	50	100	-	150	4
4	BCA-108	Computer Organization and Architecture	3	1	-	50	100	-	150	4
5	BCA-126	Software Lab-II (Based on BCA-106)	-	-	3	50	-	50	100	3
6	BCA-130	Seminar	-	-	-	100	-	-	100	1
Total			**12**	**4**	**3**	**350**	**400**	**50**	**800**	**20**

BCA-101 MATHEMATICAL FOUNDATION

Total Marks	**: 150**
Minimum Pass Marks	**: 40%**
Theory Paper	**: 100**
Maximum Time	**: 3 Hrs**
Internal Assessment	**: 50**

Note: Total **8 Questions** are to be set by the examiner covering the entire syllabus uniformly. **Question No. 1(COMPULSORY)** having **Objective Type Questions** of **2 marks** from entire syllabus. Rest of the **Seven** questions are from **Section A, B & C** of **Syllabus.** A candidate is require to attempt any **Four questions** out of Sections A, B & C by selecting **ATLEAST ONE** Question from Each Section. All questions shall carry equal marks.

SECTION A

DETERMINANTS: Definition, Minors, Cofactors, Properties of Determinants.

MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, Rank of Matrix Dependence of Vectors, Eigen Vectors of a Matrix, Cayley-Hamilton Theorem (without proof). Solving simultaneous equations using gauss elimination method, gauss jaordan method and matrix inversion method.

STATISTICS: **Measures of Central Tendancy, Prepareing frequency distribution table, arithmetic mean, geometric mean, harmonic mean, median and mode. Measure of dispersion: Range, mean, deviation, standard deviation, co-efficient of variation.**

SECTION B

LIMITS & CONTINUITY: Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities.

DIFFERENTIATION: Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin's & Taylor's), Indeterminate Forms, L' Hospitals Rule, Maxima & Minima, Concavity, Asymptote, Singular Points, Curve Tracing, Successive Differentiation & Liebnitz Theorem.

SECTION C

INTEGRATION: Integral as Limit of Sum, Riemann Sum, Fundamental Theorem of
Calculus, Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Integration of Algebraic and Transcedental Functions, Elementary concepts of Gamma and Beta Functions.

VECTOR ALGEBRA: Definition of a vector in 2 and 3 Dimensions; Double and Triple Scalar and Vector Product and their Applications.

References

- Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995.
- Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons, 1996.
- B.S. Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998..
- H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th Revised Edition, 2001.
- Shanti Narayan, "Integral Calculus", S. Chand & Company, 1999
- Shanti Narayan, "Differential Caluculs", S.Chand & Company, 1998.

BCA-103 DIGITAL ELECTRONICS

Total Marks	**: 150**
Minimum Pass Marks	**: 40%**
Theory Paper	**: 100**
Maximum Time	**: 3 Hrs**
Internal Assessment	**: 50**

Note: Total **8 Questions** are to be set by the examiner covering the entire syllabus uniformly. **Question No. 1(COMPULSORY)** having **Objective Type Questions** of **2 marks** from entire syllabus. Rest of the **Seven** questions are from **Section A, B & C** of **Syllabus.** A candidate is require to attempt any **Four questions** out of Sections A, B & C by selecting **ATLEAST ONE** Question from Each Section. All questions shall carry equal marks.

SECTION A

Number System: Binary, octal, Hexadecimal Number, their addition and substraction, Base conversions, Number code: 8421, Other BCD codes, Grey, ASCII, EBCDIC.

Boolean Algebra: Laws and theorems of Boolean algebra. De Morgan's theorem, XOR and XNOR gates, Half and Full Adder and Subtractor circuits.

SECTION B

Fundamentals: Products, Sum of products and Product of sums, Form of Boolean expressions, Truth Tables and Karnaugh maps, pair reads octets and Karnaugh simplification. Mltiplexers BCD to Decimal to BCD decoders and, decoders' characteristics of digital integrated digitals.

SECTION C

Flip Flop: RS Flip Flop, Clocked, RS Flip Flop, Edge trigger D Flip Flop. Flip Flop Switching time, OK Flip Flop. JK Master Slave Flip Flop. Clock wave forms, Shift registers: Serial in and serial out, Parallel in and parallel out. Counters: Asynchronous counters Synchronous counters, ring counter.

Memories for Digital: System: Semiconductor Memories, Memory organization and expansion, classification of memories on' the basis of principles of operation, physical characteristics and fabrication technology, ROM and basic memory cells.

References:

- Moris Mano, "Digital Logic and Computer Design", PHI Publications, 2002
- R. P. Jain, "Modern Digital Electronics", TMH, 3rd Edition, 2003.
- R.L. Tokheim, "Digital Electronics, Principles and Applications", Tata McGraw Hill, 1999.
- W. Gothman, "Digital electronics", PHI.
- S. Salivahanan & S. Arivyhgan. "Digital circuits and design", Vikas Publication, 2001
- Malvino Leach, "Digital Principles and Application", TMH, 1999.
- Floyd, Thomas : Digital Fundamentals.
- V. Rajaraman : Computer Fundamentals (PHI)

BCA-105 COMPUTER FUNDAMENTS & APPLICATION TOOLS

Total Marks	**: 150**
Minimum Pass Marks	**: 40%**
Theory Paper	**: 100**
Maximum Time	**: 3 Hrs**
Internal Assessment	**: 50**

Note: Total **8 Questions** are to be set by the examiner covering the entire syllabus uniformly. **Question No. 1(COMPULSORY)** having **Objective Type Questions** of **2 marks** from entire syllabus. Rest of the **Seven** questions are from **Section A, B & C** of **Syllabus.** A candidate is require to attempt any **Four questions** out of Sections A, B & C by selecting **ATLEAST ONE** Question from Each Section. All questions shall carry equal marks.

SECTION A

MS Windows: Introduction to M.S. Windows; Features of Windows; Various versions of Windows & its use; Working with Windows; My Computer & Recycle bin ; Desktop, Icons and Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbars; Working with Files & Folders; simple operations like copy, delete ,moving of files and folders from one drive to another, Shortcuts & Autostarts; Accessories and Windows Settings using Control Panel- setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hardware & Software program on your computer.

Introduction to Internet and E-mail; searching information through a search engines (google, altavista, sulekha, khoj etc)

SECTION B

MS Word Basics: Introduction to MS Office; Introduction to MSWord; Features & area of use. Working with MS Word.; Menus & Commands; Toolbars & Buttons; Shortcut Menus, Wizards & Templates; Creating a New Document; Different Page Views and layouts; Applying various Text Enhancements; Working with – Styles, Text Attributes; Paragraph and Page Formatting; Text Editing using various features ; Bullets, Numbering, Auto formatting, Printing & various print options

Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Autotexts, Symbols etc.; Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding References and Graphics; Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats.

SECTION C

MS Excel: Introduction and area of use; Working with MS Excel.; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options.

MS PowerPoint: Introduction & area of use; Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides & its different views; Inserting,

Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists; Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects; Designing & Presentation of a Slide Show; Printing Presentations, Notes, Handouts with print options.

References:

- Windows XP Complete Reference. BPB Publications
- Joe Habraken, Microsoft Office 2000, 8 in 1 by, Prentice Hall of India
- I.T. Tools and Applications by A. Mansoor, Pragya Publications, Matura

BCA-107 COMMUNICATION SKILLS-I

Total Marks	**: 150**
Minimum Pass Marks	**: 40%**
Theory Paper	**: 100**
Maximum Time	**: 3 Hrs**
Internal Assessment	**: 50**

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SECTION A

Communicative Grammar:

Part A : Spotting the errors pertaining to nouns, pronouns, adjective and adverbs; Concord - grammatical concord, notional concord and the principle of proximity between subject and verb.

Part B : Changing the voice : from Active to Passive and Passive to Active.

Lexis: Idioms and phrases; Words often confused; One-Word Substitutes; Formation of words (suffixes, prefixes and derivatives);

SECTION B

Oral Communication:

Part-A: Introduction to principal components of spoken English – Transcription, Wordaccent, Intonation, Weak forms in English.

Part-B: Developing listening and speaking skills through various activities, such as (a) role play activities, (b) Practising short dialogues (c) Group discussion (d) Debates (e) Speeches (f) Listening to news bulletins (g) Viewing and reviewing T.V. programmes etc.

Written Communication: Developing reading and writing skills through such tasks/activities as developingoutlines, key expressions, situations, slogan writing and theme building exercises, dialogue writing, interpreting pictures/cartoons.

SECTION C

Book Review – Herein the students will be required to read and submit a review of a book (Literary or non-literary) of their own choice. This will be followed by a presentation of the same in the class.

Technical Writing:

(a) Business Letters, Format of Business letters and Business letter writing
(b) E-mail writing
(c) Reports, Types of Reports and Format of Formal Reports
(d) Press Report Writing

References:

- Language in Use (Upper intermediate Level, Adrian Doff Christopher Jones, Cambridge University Press
- Common Errors in English, Abul Hashem, Ramesh Publishing House, new Delhi.
- Objective English, Tata Mc. Graw Hill Publishing Company Ltd., New Delhi.
- Spoken English for India, R.K. Bansal & J.B. Harrison, Orient Longman, Delhi.
- The sounds of English, Veena Kumar, Makaav Educational Software, New Delhi.
- English Phonetics & Phonology, P. Roach, Cambridge University Press, London.
- English for Engineers and Technologists: A Skill Approach, Vol. 2, Orient Longman, Delhi.
- Business Communication, M.S. Ramesh and C.C. Pattanshetti, R.Chand and Company, Delhi
- Group Discussion, Sudha Publications/Ramesh Publishing House, New Delhi.
- English Grammar & Composition. By Rajinder Pal & Prem Lata Suri, Sultan Chand Pub. New Delhi.

BCA-102 INTRODUCTION TO INFORMATION TECHNOLOGY

Total Marks	**: 150**
Minimum Pass Marks	**: 40%**
Theory Paper	**: 100**
Maximum Time	**: 3 Hrs**
Internal Assessment	**: 50**

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SECTION A

What are computers? The evolution of computers, Classification of computers, The control unit, computer organization & Block diagram representation, storage devices, microprocessors, instruction set, CISC & RISC processor, Input-Output devices, interconnection architectures.
Low level and high level languages, assemblers, compilers, interpreters, linkers, algorithms, flow charting, decision tables, pseudo code, software, application software packages

SECTION B

Operating system concepts, Different types of operating systems, structure of operating system, DOS/UNIX/LINUX commands, Data Processing, File systems and Database Management Systems, different types of Database Management System.

SECTION C

Basic elements of a Communication System, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog Transmission, Network topologies, Network Types (LAN, WAN and MAN), Communication protocols, Inter networking tools, Distributed Computing Systems

REFERENCES:

- Alex Leon & Mathews Leon, “Fundamentals of Information Technology”, Leon Techworld, 1999.
- P. K. Sinha & Priti Sinha , “Computer Fundamentals”, BPB Publications, 1992.
- V. Raja Raman, “Introduction to Computers”, PHI, 1998.
- Alex Leon & Mathews Leon, “Introduction to Computers”, Vikas Publishing House,1999.
- Norton Peter, “Introduction to computers”, 4th Ed., TMH, 2001.
- Simon Haykins, “Communication System”, John Wiley & Sons, 1999.

BCA-104 DISCRETE MATHEMATICS

Total Marks	**: 150**
Minimum Pass Marks	**: 40%**
Theory Paper	**: 100**
Maximum Time	**: 3 Hrs**
Internal Assessment	**: 50**

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SECTION - A

Graphs: Introduction to graphs, Graph terminology, Representing Graphs and Graph Isomorphism, Connectivity. Directed and undirected graphs and their matrix representations, reachability, Chains, Circuits, Eulers paths and cycles, Hamiltonian paths and cycles, Minima's Path Application(Flow charts and state transition Graphs, Algorithm for determining cycle and minimal paths), Trees, Binary trees, Binary search trees and traversals, Graph coloring.

SECTION – B

Groups & Subgroups: Group axioms, permutation groups, subgroups, cosets, normal subgroups, semi - groups, free semi – groups, applications.
Finite Fields: Definition, representation, structure, minimal polynomials, polynomial roots, Splitting Field, Integral Domain, Irreducible polynomial.
Formal Languages: Representation of special languages and grammars, finite state machines.

SECTION – C

Lattices & Boolean Algebra: Relation to partial ordering, lattices, Hasse Diagram, Axiomatic definition of Boolean algebra as algebraic structures with two operations basic results truth values and truth tables, the algebra of propositional functions, Boolean algebra of truth values, Applications (Switching Circuit, Gate Circuit).

References:

- Kenneth G. Rosen: “Discrete Mathematics and Its Applications”, McGRAW-Hill International Edition, Mathematics Series.
- Babu Ram: “Discrete Mathematics and Its Applications”, Vinayaka Publications.
- C.L. Liu, “Discrete Mathematics and Its Applications”, McGRAW-Hill International Edition, Mathematics Series.
- Trembley, “Discrete Mathematics and Its Applications”, Tata McGRAW-Hill.
- Alan Doerr, Kenneth Levaseur, “Applied Discrete Structures for Computer Sciences”, Galgotia Publications Pvt. Ltd.
- Scymour Lipschutz, Marc Lars Lipson, “Discrete Mathematics”, McGRAW-HILL International Editions, Schaum’s Series.
- Bernard Kolman, Robert C. Busby, “Discrete Mathematical Structures for Computer Science”, Prentice Hall of India.

BCA-106 PROGRAMMING IN C

Total Marks	**: 150**
Minimum Pass Marks	**: 40%**
Theory Paper	**: 100**
Maximum Time	**: 3 Hrs**
Internal Assessment	**: 50**

Note: Total **8 Questions** are to be set by the examiner covering the entire syllabus uniformly. **Question No. 1(COMPULSORY)** having **Objective Type Questions** of **2 marks** from entire syllabus. Rest of the **Seven** questions are from **Section A, B & C** of **Syllabus.** A candidate is requiring attempting any **Four questions** out of Sections A, B & C by selecting **ATLEAST ONE** Question from Each Section. All questions shall carry equal marks.

SECTION – A

Elements of C: C character set, identifiers and keywords, Data types: declaration and definition, storage classes in C, Type conversion, Types of error, 'C' macro, macro vs function.
Operators: Arithmetic, relational, logical, bitwise, unary, assignment and conditional operators and their hierarchy & associativity.
Data input/output.

SECTION – B

Control statements: Sequencing, Selection: if and switch statement; alternation, Repetition: for, while, and do-while loop; break, continue, goto.
Functions: Definition, prototypes, passing parameters, recursion.
Data Structures: arrays, struct, union, string, data files.
Pointers: Declaration, operations on pointers, array of pointers, pointers to arrays.

SECTION –C

String handling, Streams, File Operations, Formatted I/O, Character I/ O, Line I/O, Block I/O, File positioning, String I/ O.
Low - level Programming : Bitwise operators, Bit- fields in Structures, Other low- level techniques : Defining machine- dependent types, Using unions to provide multiple views of data, using pointers as addresses, the volatile type qualifier.
Writing Large programs: Source files, Header files, dividing a program into files, Building a multiple- file program.

References:

- Deitel & Deitel: C How to Program (Prentice Hall), 1996.
- Yashwant Kanetker, Let us C, BPB Publications.
- R. B. Patel, Fundamental of Computers and Programming in C, Khanna Book Publishing Company PVT. LTD. Delhi, India, 1st edition, 2008, ISBN: 13: 978-81-906988-7-0, pp. 1-962.
- Gottfried, Programming with C, Tata McGraw Hill.
- Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, 2nd Ed., Prentice Hall of India.

BCA-108 COMPUTER ORGANIZATION AND ARCHITECTURE

Total Marks	**: 150**
Minimum Pass Marks	**: 40%**
Theory Paper	**: 100**
Maximum Time	**: 3 Hrs**
Internal Assessment	**: 50**

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SECTION-A

Basis Computer Architecture, Functional Organisation, Register Organisation, Arithmetic and Logic Unit, Central Processing unit, Instruction Formats, Addressing Modes. Data Transfer and Manipulation, interrupts RISC/CISC architecture.

SECTION-B

Register transfer and macro-operations, Register Transfer Languages (RTL). Arithmetic, Logic and Shift Macro-operations, Sequencing, Micro-program sequences.

SECTION –C

Memory & Storage: Processor Vs. Memory speed: Cache memory. Associative memory, Virtual memory and Memory management

Input/Output organization: Peripheral devices, I/O Asynchronous Data Transfer: Strobe Control, Data Transfer Schemes (Programmed, Initiated, DW, Transfer), I/O Processor.

References:

- Moris Mano, “Computer System Architecture”, PHI Publications, 2002.
- R. P. Jain, “Modern Digital Electronics”, TMH, 3rd Edition, 2003.
- V. Rajaraman : Computer Fundamentals (PHI).

Syllabus – II Year

Bachelor of Computer Application

(**Approved by AICTE, Ministry of HRD, Govt of India & DTE, Govt of Haryana and Affiliated to M. D. University, Rohtak**)

M.D. UNIVERSITY, ROHTAK

SCHEME OF STUDIES & EXAMINATION
BACHELOR OF COMPUTER APPLICATION (BCA)

SEMESTER-I

Paper Code	Title of Paper	Periods per week	Max. Marks	Internal assessment	Exam Duration Hours
BCA-101	Computer Fundaments and Programming	4	75	25	3
BCA-102	Mathematics-I	4	75	25	3
BCA-103	Mathematics-II	4	75	25	3
BCA-104	Business Practices	4	75	25	3
BCA-105	Practical Software Lab (Base on paper BCA-101 and Software Tools)	8 per week	75	25	6(Two sittings)

M.D. UNIVERSITY, ROHTAK

SCHEME OF STUDIES & EXAMINATION
BACHELOR OF COMPUTER APPLICATION (BCA)
SEMESTER-II

Paper Code	Title of Paper	Periods per week	Max. Marks	Internal assessment	Exam Duration Hours
BCA-106	Data and File Structure	4	75	25	3
BCA-107	Structured System Analysis	4	75	25	3
BCA-108	Mathematical foundations of Computer Science	4	75	25	3
BCA-109	Digital Electronics	4	75	25	3
BCA-110	Practice Software Lab (Based on paper BCA-106 And Software Tools)Environmental studies	8 Per Week	75	25	6 (Two sittings)

M.D. UNIVERSITY, ROHTAK

SCHEME OF STUDIES & EXAMINATION
BACHELOR OF COMPUTER APPLICATION (BCA)
SEMESTER-III

Paper Code	Title of Paper	Periods per week	Max. Marks	Internal assessment	Exam Duration Hours
BCA-201	Computer System Architecture	4	75	25	3
BCA-202	Algorithms and Advance Data Structure	4	75	25	3
BCA-203	Micro processors and Assembly language	4	75	25	3
BCA-204	Data Base Systems	4	75	25	3
BCA-205	Practice Software Lab (Base on paper BCA-202 and BCA-204)	8 hours per week	75	25	3 (Two sittings)

M.D. UNIVERSITY, ROHTAK

SCHEME OF STUDIES & EXAMINATION
BACHELOR OF COMPUTER APPLICATION (BCA)
SEMESTER-IV

Paper Code	Title of Paper	Periods per week	Max. Marks	Internal assessment	Exam Duration Hours
BCA-206	Operating Systems Organization and UNIX	4	75	25	3
BCA-207	Software Engineering	4	75	25	3
BCA-208	Object Oriented Design and Programming	4	75	25	3
BCA-209	Financial Accounting	4	75	25	3
BCA-210	Practical Software Lab (Based on Paper BCA-206 and BCA-207)	8 Hours Per week	75	25	6

M.D. UNIVERSITY, ROHTAK

SCHEME OF STUDIES & EXAMINATION
BACHELOR OF COMPUTER APPLICATION (BCA)
SEMESTER-V

Paper Code	Title of Paper	Periods per week	Max. Marks	Internal assessment	Exam Duration Hours
BCA-301	Data Communication and Networks	4	75	25	3
BCA-302	Computer Graphics	4	75	25	3
BCA-303	Principles of Visual and Windows Programming	4	75	25	3
BCA-304	Java Programming & Internet Applications	4	75	25	3
BCA-305	Practical Software Lab (Based on Paper BCA-301, 302, 303,304)	8 Hours per week	75	25	6 (Two sittings)

M.D. UNIVERSITY, ROHTAK

SCHEME OF STUDIES & EXAMINATION
BACHELOR OF COMPUTER APPLICATION (BCA)
SEMESTER-VI

Paper Code	Title of Paper	Periods per week	Max. Marks	Internal assessment	Exam Duration Hours
BCA-306	Internet Technologies and application	4	75	25	3
BCA-307	Scientific and Statistical Computing	4	75	25	3
BCA-308	Multimedia Information Systems	4	75	25	3
BCA-309	Management Information Systems	4	75	25	3
BCA-310	Practical Software Lab (Based on paper) BCA-306, 307 and 308	8	75	25	6 (Two sittings)

BCA-201 COMPUTER SYSTEM ARCHITETURE

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam	**:**	3 Hours

Register transfer and Micro-operations, Register Transfer Language, Bus and Memory. Transfers, Artihmetic, Logic Micro-operations, Shift Micro-operations.

Basic Computer Organization and Design :

Instrcution and instructions Codes, Computer instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Inputoutput and Interrupts; Complete Computer Description.

Programming the Basic Computer

Machine Language, Assembly Language, The assembler, program loops, programming Artihmetic and Logic, Subroutine, Inputs-Outputs programming. Micro-programmed Control; Control Memory, Address Sequencing, Micro-programme Example, Design of Control Unit. **Central Pocessing Unit** General Register Organization Stack Organization Instruction Formats, Addressing Modes, Data and Transfer Manipulation, Program Control, Reduced Instruction Set Computer, Pipeline and Vector Processing parallel processing pipelining, Arithmetic Pipeline, RISC Quoekubem Vector Processing, Arrays Processors.

Computer Arithmetic:

Addition and Subtraction, Multiplication Algorithms, Division algorithm, Floating-Point Arithmetic Operations, Decimal arithmetic Unit, Decimal Arithmetic Operations.

Input-Output Organization:

Peripheral Devices, Input-Output interface, Asychronous Data Transfer, Modes of Transfer, Priority interrupt, Direct Memory Access (DMA), input-output processors (IOP), Serial communicatoin multiprocessors, Inter-connection stuctures, Inter-processor ArBC Aration, Inter-processor Communication and Synchronization, Cache Coherence.

Note : Examiner is requested to set 8 questions covering whole syllabus, in each paper, out of which the candidates will be required to attempt any 5 questions.

BCA-202 ALGORITHMS AND ADVANCED DATA STRUCTURES

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Trees : Search Trees, AVL trees, threading :

Storage Management :

Run time storage management, garbage collection and compaction.

Sorting techniques

Insertion sort, quick sort, merge sort, heap sort, selection sort, radix sort, external sort; lower bound for sorting by compression of keys. Selection and adversly argument Traversal : minimum spanning tree. Shortest path, graph component algorithms, String Matching KMP and Boyer Moore algorithms.

Dynamic Programming

Matric multiplication and optional binary search tree algorithms.

NP Complete Problem

Complexity classes P and NP; examples of problems in the NP class.

Parallel Algorithms

Parallelism, PRAM and other models, Parallel algorithms finding maximum element in a list, merging and sorting.

Note : Examiner is requested to set 8 questions covering whole syllabus, in each paper, out of which the candidates will be required to attempt any 5 questions.

BCA-203 MICRO-PROCESSOR & ASSEMBLY LANGUAGE

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Evolution of micro-processor : overview of intel pro-pentium Motorola 68000 series, power PC, DEC-Alphacip; CISC architecture. Basic micro processor architecture and interface : Internal architecture, external system bus architecture, memory and Input/output interface.

Programming mode

General-purpose registers; pointer and index registers; flag; segment registers, program invisible registers; memory addressing and addressing modes. Memory interfacing; memory address decoding;
cache memory and cache controllers. Basic I/O inteface; I/O mapped I/O memory mapped I/O; basic input/
output and handshaking input/output port address decoding; 8255 progrmmable peripheral interface; 8279 programmable keyboard and display interface; 8254 pragrammable time; 8251 programmable/ communication interface; interrupts-interrupt vector, vector tables, hardware and software Interrupts, 8259 programmable Interrupts controller; real-time clock; direct memory access, 8237/ 8257 DMA controller; video controllers; shared bus operation. (The course should be taught in the context of 8085 to intel-pro pentium
micro-processor and its assembly languages).

Note : Examiner is requested to set 8 questions covering whole syllabus, in each paper, out of which the candidates will be required to attempt any 5 questions.

BCA-204 DATABASE SYSTEMS

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Data Modelling for a database : records and files, abstraction and data integration. Database Management System : Relational, Network; Hierarchieal. Relational Data Manipulations : Rlational Algebra, Relational Calculus, SQL, Relational Database Design : Functional Dependencies, Finding Keys : 1st to 3rd NFs, BCNF, Lossess Join and Dependency preserving decomposition, computing clousres of set FDs, Finding Keys. Query Processing : General Strategies for query processing, query optimization, query processor, concepts of security, concurrency and recovery; Database Design Project : Definition and analysis of existing systesm, Preliminary and final design, Testing and implementation Operation and tunning. Use of Relational DBMS package for class project.

Note : Examiner is requested to set 8 questions covering whole syllabus, in each paper, out of which the candidates will be required to attempt any 5 questions.

BCA-205 PRACTICE SOFTWARE LAB

External	**:**	75 Marks
Internal	:	25 Marks
Total	:	100 Marks
Duration of Exam.	**:**	3 Hours
(Two seating)		

(Base on paper BCA-202 and BCA-204) 8 hours per week)

BCA-206 OPERATING SYSTEM ORGANIZATION AND UNIX

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Operating systems overview : Operating systems as an extended machine & resource manager, operating systems classification; Operating systems and system calls; Operating systems architecture. Process on Management functions : process model, hierarchies, and implementation; process states and transitions; multi-programming, multi-tasking, multi-threading; level of schedulers and scheduling algorithms, micro-kernel architecture. Memory Management Functions : memory management of single user operating systems partition, swapping, paging, segmentation, virtual memory. Device Management function : I/O devices and controllers, interrupt handlers, device independent I/O software, user-space I/O software; disk scheduling; clock hardware software; terminal input/output software. File Management functions; file naming, structure, types, access machanisms, attributes and operations; hierarchiecal directory systems, directory structures and directory operations; file space allocations; file sharing, file locking, symbolic links; file protection and security : distributed file systems. Concurrent programming : sequential and concurrent process; precedence graph, Bernsterins condition; time problem, classical process co-ordination problems, deadlock handling, Inter-process communication. (This course should be taught in the context of UNIX operating system).

Note : Examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

BCA-207 SOFTWARE ENGINEERING

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Software engineering definition and paradigms, A generic view of Software Engineering, Requirements analysis, Statement of system scope, isolation of top level processes and entities and their allocation to physical elements, refinement and review. Analyzing a problem, creating a software specification document, review for correctness, consistency and completeness. Designing software solutions : Refining the software specifications :

Application of fundamental Design concept for data, architectural and procedural designs using software blue print methodology and object oriented design paradigm; creating a design document Review of conformance to software requirements and quality. Software Implementation : Relationship between design and implementation; Implementation issues and programming support environment; Coding the procedural design; Good coding style, and review of correctness and readability. Software testing : Role of testing and its relationship to quality assurance; Nature and limitation of software testing, Software testing methods.

Software maintenance : Maintenance as part of software evaluation, reason for maintenance, types of maintenance (Perfective, adoptive, corrective), designing for maintanability, teachniques for maintenance,

Configuration management. Comprehensive examples using available software platform/case tools.

Note : Examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

BCA-208 OBJECT ORIENTED DESIGN AND PROGRAMMING

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Introduction to Object Oriented Modeling, modelling techniques, Object Oriented Design, Object design, comparison of methodologies (SA/SD, OMT, JSD) design implementation, Object Oriented Languages, Programming in C++, Applications in database, compilers, animation and Business.

Note : Examiner is requested to set 8 questions covering whole syllabus, in each paper, out of which the candidates will be required to attempt any 5 questions.

BCA-209 FINANCIAL ACCOUNTING

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Conceptual Framework of Accounting : Nature and Scope of Accounting information, Identifying and :

1. Recording accounting transaction using traditional and accounting equations approach, Generally accepted accounting principles, Accounting Standards in India. Bases of accounting- Cash and accrued. Capital and Revenue item.
2. Fundamentals of Computerised Accounting System : Concept of grouping the accounting heads, schemes of assigning the codes to accounting heads, Maintaining the hierarchy of Ledger accounts for perparing control accounts.
3. Applications of computers in accounts :
    (a) Accounting procedures used, in practice, for recording Cash, Bank and Journal Transactions using appropriate voucher;
    (b) Preparation of Ledger counts, Cash Book, Journal Book and Bank Book;
    (c) Preparation of Trial Balance, Profit and Loss Accounts and Balance Sheet.
    (d) Accounting for petty cash transactions and preparation of petty cash register.
    (e) Lease and Loan accounting;
    (f) Accounting system for preparing and maintaining Payrolls;
    (g) Inventory Accounting and Control;
    (h) Budget and Budgetory Control;
    (i) Accounting System for Orders booking, Processing (forwarding and acceptance) and invoicing for a trading Organization;
    (j) Accounting for Decision making control : Marginal costing and standard costing.

Note : Examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

BCA-210 PRACTICAL SOFTWARE LAB

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam	**:**	6 Hours

(Based on Papers BCA - 206 & BCA - 207)

BCA-301 DATA COMMUNICATION & NETWORK

External	:	75 Marks
Internal	:	25 Marks
Total	:	100 Marks
Duration of Exam.	:	3 Hours

Data Communications : concepts of data, signal, channel, bandwidth, bid-rate and baud-rate Fourier analysis; maximum data-rate of channel; analog and digital communications, asynchronous and synchronous transmission; data encoding techniques; modulation technique; multiplexing TI/EI carrier systems; transmission medium; transmission errors, error-detection and correction code.

Network Classification and data-communication services: Local area networks metropolitan area network. Wide area networks, wireless network, internet work, Switched multimega BCA Data Services, X.25, Frame Relay, narrowband and broadband ISDN, Asynchronous Transfer Modes. Network reference Models: Layered architecture, protocol hierarchies, interface and services; ISO-OSI reference model, TCP/ IP reference model; Novel Netware, Internet protocol stacks. Data link layer functions and protocols: framing, error-control flow

Control, sliding window protocol, DHCL SLIP and PPP protocol. Medium access sub layer: CSMA/CD & Ethernet, token ring, FDDI; IEEE standards for LAN and WAN; satellite networks TDMA and VSAT.

Note: Examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

BCA-302 COMPUTER GRAPHICS

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Development of Computer graphics; basic graphics system and standards; Raster Scan and Randod Scan graphics; continual refresh and storage displays. Display processoes and character generators; colour display techniques; frame buffer and BCA BCA operations concepts in raster graphics. Points, lines and curves; ration; polygon filling; conic-section generation, antiliasing. Two dimenstional viewing; basic transformations; interactive picture construction techniques, Interactive inputs/outputs devices. Three-dimensional concepts : 3-D representations : and transformations; 3-D viewing; algorithm for 3-D volumes spine curve and surfaces; Fractals; Quadtree and octree data structure. Hidden line and surface, rendering and animation.

Note : Examiner is requested to set 8 questions covering whole syllabus, in each paper, out of which the candidates will be required to attempt any 5 questions.

BCA-303 PRINCIPLE OF VISUAL AND WINDOWS PROGRAMMING

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Diagram understanding : The symbolic description behind the scenes. Generalized icons; generalizations, formal specifications of iconic systems, iconic operations, Syntactic-semantic analysis of iconic sentences, user-interfaces as iconic systems, determination of iconic purity, a visual Language compiler; The icon dictionary ID Physical logical part of icon, structure of ID, operator dictionary CD; The environment of a window application, Basic concepts of windows programming. The programming with the graphics device interface. Displaying Text, Receiving commands and data from user.

Note : Examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

BCA-304 JAVA PROGRAMMING AND INTERNET APPLICATION

External	:	75 Marks
Internal	:	25 Marks
Total	:	100 Marks
Duration of Exam.	:	3 Hours

Internet Application : Introduction to Internet : E-mail Architecture & Services, user agent, message format & transfer, SMTP; World

Wide Web (www)- Domain Name System, The Client side, The server side, Creating and locating information on the web, search engines, URL's, HTTP, FTP, Telnet; Web Browsers, Chat & Bulletin Board, USENET & NNTP (Network News Transfer Protocol). Java and The Internet : The Java programming language and its characteristics; Java run-time environment; Java compiler; Java developer kit; running Java applications and Java applets. Java programming : Elements of Java : Data types, scalar data types, operators & expressions, control structures. Class, object & methods, constructors, finalizer, visibility controls, array, string & vectors, inheritance, interfaces, package multithreading, applet programming. Exception Handling-Defining and throwing exceptions, creating your own exceptions. Input/Output : streams, byte and character stream, the class printstream, data streams, string tokenizer class, stream tokenizers. Delegation Event Model. AWT classes, AWT control, Layout managers & menus.

Note : Examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

References :

1. Comer Douglas E. : Computer Networks and Internets, Addison-Wesley.
2. Ince Darrel & Freeman Adam : Programming the Internet with Java, revised edition, Addison-Wesley.
3. Balagurusamy E.: Programming with Java, Latest Edition, Tata McGraw-Hill.
4. Schildt H.: The Complete Reference Java 2, Latest Edition, Tata McGraw-Hill.
5. Mughal K.A., Rasmussen R.W. : A Programmer's Guide to Java Certification, Addition-Wesley.

Note : Latest and good books may be added from time to time.

BCA-305 PRACTICAL – SOFTWARE LAB

External	**:**	75 Marks
Internal	:	25 Marks
Total	:	100 Marks
Duration of Exam.	**:**	3 Hours
(Two Seating)		

(Based on Papers BCA-301, 302, 303 and 304)

BCA-306 INTERNET TECHNOLOGIES & APPLICATIONS

External	:	75 Marks
Internal	:	25 Marks
Total	:	100 Marks
Duration of Exam.	:	3 Hours

Network Layer functions and protocols ; Switching; routing and congestion control; X.25; Internet protocol (IP); Addressing flow control, connection management, multiplexing, Transmission control protocol (TCP) and user datagram protocol (UDP), socket & TLI interface. Application layer services and Protocols : Domain name services network management protocol, electronic mail and file transfer protocol, world wide webs. Survey of contemporary Internet Technologies, The Role, use and implementation of current tools. Basic TCP/IP, name, space, correctness, and protocols, worldwide/HTML Techniques for text, images, links and forms. Indexing method : Gopher, WAIS, Server side programming, CGI scripts, Security issues, Emphasis on understanding, exploring and extending internet technologies using Java or perl.

Note : Examiner is requested to set 8 questions covering whole syllabus, in each paper, out of which the candidates will be required to attempt any 5 questions.

BCA-307 SCIENTIFIC & STATISTICAL COMPUTING

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Numerical methods :

Floating point artihmetic : Basic concept of floating point numbers systems, implications of finite precision, illustrations of errors due to round off. Interpolation Finite difference calculus, polynomial interpolation.

Approximation Uniform, discrete least square, polynomial, fourier. Numerical Integration & Differentiation Interpolatory numerical integration; numerical differentiation. Solution of non-linear: Bisection, fixed point iteration, Newton's Rephson's Methods. Solution of Ordinary differential equation - Taylor series, method,

Range-Wulta method, Euler method. Random variables and their distributions : Random variables (discrete

and continuous), probability density and distribution functions, special distributions (Binomial distribution functions, special distributions poiseon, Uniform Exponential), mean and variance, chebychey inequality, independent random variables, functions of random variables and their distribution. Limit Theormes : Poisson and normal approximations, Control limit Theorem Law of large numbers.

Note : Examiner is requested to set 8 questions covering whole syllabus, in each paper, out of which the candidates will be required to attempt any 5 questions. 27 28

BCA-308 MULTI MEDIA INFORMATION SYSTEMS

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

Introduction to multimedia technology-computers, communications and entertainment; framework for multimedia; M/M devices, presentation devices and the user interface; M/M presentation and authoring.

Digital representation of sound and transmission, brief survey of speech recognition and generation; digital video and image compression; JPEG image compression standard; MPEG motion video compression; DVI technology; time-based media representation and delivery. M/M Software environments; limitations of workstation operating system; M/M system service; OS Support for continuous media applications; media stream protocol; M/M file systems and information representation; data-media for M/M and Hypermedia information. Applications of M/M; intelligent M/M system. Desktop BR; Virtual reality OS; distributed virtual environment system; virtual environment displays and orientation tracking; visually coupled system requirements intelligent VR software systems. Applications of enviroments, in various fields, such as medical entertainment, manufacturing, business, education etc.

Note : Examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

BCA-309 MANAGEMENT INFORMATION SYSTEM
OR
PROGRAMMING LANGUAGE

External	:	75 Marks
Internal	:	25 Marks
Total	:	100 Marks
Duration of Exam.	:	3 Hours

Data and information; forms of data; data generation, capturing, collection, recording, retrieval and processing. Information and Information systems; Computer Based Information System – including office Automation Systems forms of information systems; Computer in information system ; Computer systems Transaction Processing Systems and Decision support Systems; Expert Systems. Role of VBIS in Government; Society and Business organisations. Using Information Systems as a Cost reduction measure in Society. Macros and Micro level information systems. PC based software such as MS-Office, as a micro level information processing tool.

Note : Examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

BCA-310 PRACTICAL SOFTWARE LAB

External	**:**	75 Marks
Internal	**:**	25 Marks
Total	**:**	100 Marks
Duration of Exam.	**:**	3 Hours

(Two Seating)

(Based on Papers BCA - 306, 307 and 308)