Punjab Technical University
Jalandhar

Syllabus Scheme

(1st to 6th Semester)

For

Bachelors in

Computer Applications (BCA)

Applicable from August 2005 & Onwards

STUDY SCHEME FOR BCA

SEMESTER -1							
Code	**Subject**	**L**	**P**	**TOTAL**	**INT.**	**EXT.**	**TOTAL MARKS**
BCA-101	Introduction to Information Technology	24	24	48	25	75	100
BCA-102	Math (Bridge Course)	48	0	48	25	75	100
BCA-103	Basic Accounting	32	16	48	25	75	100
BCA-104	Programming in C	24	24	48	25	75	100
BCA-105	Communication Skills (Business Communication)	48	0	48	25	75	100
BCA-106	Communication & Soft Skills	30	-	30	50	-	50
BCA -107	Software Lab -I(BC-101 & 103	-	-	-	25	75	100
BCA -108	Software Lab -II(BC-104)	**-**	**-**	**-**	25	75	100
TOTAL		**206**	**64**	**270**	**225**	**525**	**750**
SEMESTER -2							
Code	**Subject**	**L**	**P**	**TOTAL**	**INT.**	**EXT.**	**TOTAL MARKS**
BCA-201	Principles of Management	48	0	48	25	75	100
BCA-202	System Analysis & Design	48	0	48	25	75	100
BCA-203	Math-I (Discrete)	48	0	48	25	75	100
BCA-204	Data Structures	24	24	48	25	75	100
BCA-205	Digital Ckt. & Logic Design	32	16	48	25	75	100
BCA -206	Hardware Lab-I (BC -205)	-	-	-	25	75	100
BCA -207	Software Lab-III (BC-204)	**-**	**-**	**-**	25	75	100
TOTAL		**200**	**40**	**240**	**175**	**525**	**700**
SEMESTER - 3							
Code	**Subject**	**L**	**P**	**TOTAL**	**INT.**	**EXT.**	**TOTAL MARKS**
BCA-301	Math-II (Computer Oriented Methods)	30	18	48	25	75	100
BCA-302	Management Information Systems	40	0	40	25	75	100
BCA-303	Software Engineering	40	0	40	25	75	100
BCA-304	Object Oriented Programming in C++	32	32	64	25	75	100
BCA-305	Introduction to Microprocessor	32	16	48	25	75	100
BCA -306	Software Lab -IV (BC-304)	-	-	-	25	75	100
BCA -307	Hardware Lab -II (BC-305)	**-**	**-**	**-**	25	75	100
TOTAL		**174**	**66**	**240**	**175**	**525**	**700**
SEMESTER -4							
Code	**Subject**	**L**	**P**	**TOTAL**	**INT.**	**EXT.**	**TOTAL MARKS**

BCA-401	Computer Networks	36	0	36	25	75	100
BCA-402	Data Base Management System	40	20	60	25	75	100
BCA-403	Computer System Architecture	48	0	48	25	75	100
BCA-404	Operating System	36	12	48	25	75	100
BCA -405	Workshop on Visual Basic	24	24	48	100	0	100
BCA -406	Software Lab –V (BC-402)	-	-	-	25	75	100
BCA -407	Software Lab –VI (BC-405) Unix /Linux	-	-	-	25	75	100
		144	**96**	**240**	**250**	**450**	**700**
SEMESTER -5							
Code	**Subject**	**L**	**P**	**TOTAL**	**INT.**	**EXT.**	**TOTAL MARKS**
BCA-501	Internet Applications and Java	36	36	72	25	75	100
BCA-502	System Software	36	0	36	25	75	100
BCA-503	Computer Graphics	36	12	48	25	75	100
BCA-504	Operation Research	40	0	40	25	75	100
BCA -505	Software Lab –VII (Major Project I)		44	44	25	75	100
BCA -506	Software Lab –VIII (BC-501)	-	-	-	25	75	100
BCA -507	Software Lab –IX (BC-503)	-	-	-	25	75	100
TOTAL		**148**	**92**	**240**	**175**	**525**	**700**
SEMESTER -6							
Code	**Subject**	**L**	**P**	**TOTAL**	**INT.**	**EXT.**	**TOTAL MARKS**
BCA-601	Artificial Intelligence	48	0	48	25	75	100
BCA-602	Handling Operating Systems	48	48	96	25	75	100
BCA -603	Software Lab –X (Major Project II)		80	80	25	75	100
BCA -604	Software Lab –XI (Web Designing)	-	-	-	25	75	100
BCA -605	Software Lab –XII (BC-602)	-	-	-	25	75	100
BCA -606	Seminar (BC-603)	-	16	16	100	-	100
BCA -607	Comprehensive Viva-Voce	-	-	-	-	100	100
TOTAL		**96**	**144**	**240**	**225**	**525**	**700**

SEMESER -1

BCA-101 .Introduction to Information Technology

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Computer Fundamentals: Number Systems, History of Computers, Block diagram of computer & detailed significance of each part.
Study of I/O devices : Keyboard, Hard disk, Floppy disk, CD-ROM, DVD, Plotters, Scanners, mouse, Printers: Dot matrix, Laser, Thermal Inkjet, VDU.

Section II

Primary & secondary memories.
Introduction to Operating Systems & its functions
Definition of Simple batch processing, multiprogramming, multiprocessing, real-time, time-sharing systems, Concept of Spooling,

Section III

Typical DOS commands, making simple batch files.
Application of Computers in various fields : Defense, Industry, Management, Sports, Commerce, Internet.
omputer and communication: Single user, Multi-user, Workstations, and Overview of LAN, WAN:
Overview of modem, E-Mail, Fax
Internet facilities through WWW

BCA-102.BRIDGE COURSE IN MATHEMATICS

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I
Set relations and functions: elements of a set, methods of describing a set, types of set, Venn diagram, operations on sets, union, inter**Section I**nd difference of set, Duality, partioning of a set, trigonometric functions.
Section II
Binomial theorem and principle of mathematics induction
Introduction to matrix, properties of matrix; evaluation of determinant, minor and cofactors and properties of determinant
Section III
Statistics: introduction to statistics, collection, and tabulation of data, mean, median and mode.

BCA-103.Basic Accounting

Section I
Basic Accounting: Introduction, importance and scope, concepts and conventions-
Generally accepted accounting principles-double entry framework
Basic concepts of Journals, ledgers, purchase book, sales book, cashbook.
Section II
Preparation of financial statements: Profit and loss account and balance sheet.
Nature, scope, advantage and limitations of management accounting.
Section III
Sources of raising of capital in corporate undertaking –simple treatment to issue of shares, forfeiture of shares and re – issue of forfeited shares.
Application of computers in accounting.

BCA-104.Programming in 'C'

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Fundamentals: Character set, Identifiers & Keywords, Data Types, constants, set, constants, variables, expressions, statement, symbolic constants.

Operations and expressions: Arithmetic operators, unary operators, relational and logical operators, assignment and conditional operators, and library functions.

Data input and output: Preliminaries, single character input, single character output, entering input data, more about the scanf function, writing output data, more about printf function, the gets and puts function, interactive programming.

Section II

Control statements: Preliminaries, while, do-while and for statements. Nested loops, if else, switch, break continue statement.

Functions: Brief overview, defining accessing function, passing perimeters to function, specifying argument data types, function prototype and recursion.

Program structure: Storage classes, automatic, external, and static variables, more about library functions.

Array: defining and processing an array, passing pointers to a function, pointer and one dimensional arrays, operations on pointers, passing functions multidimensional arrays of pointers, passing functions to the other functions, more about pointer declarations.

Section III

Structure And Unions: Defining and processing a structure, user defined data types, structure and Pointers, passing structure to function, self-referential structures, and unions.

Data files: Opening, closing, creating, and processing and unformatted data field.

C-programming applications: Sorting (Bubble sort, Selection sort), Searching (Binary search, Linear
Search).

BCA-105.COMMUNICATION SKILLS (BUSINESS COMMUNICATION)

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Introduction to Business Communication: Meaning and Definition, Process and Classification of communication, Elements & Characteristics of communication.

Corporate communication: Formal and Informal Communication, Grapevine, Communication barriers, Importance of communication.

Section II

Principles of Effective Communications: 7 Cs Concept

Written communication: Meaning, objectives and essentials of effective written communication, media or types of Written communication.
Non – Verbal Communication: Importance, forms or Media, Kinesics.
Effective Listening: meaning, nature and importance of good listening, types of listening
Principles of effective listening, factors affecting listening, barriers in listening, difference between hearing and listening.

Section III

Writing Skills – Short Compositions: Classified Advertisements, Situation Vacant, Situation wanted, Career Guidance, Counseling, Lost and found, Sale / Purchase, To – let.
Notices – General / Public Notices, Tender Notices, Auction Notices.
Letter Writing: Official letters, Placing orders, Sending Replies, Letters to Editors, Application for job.
Comprehension Passages (From text book only comprehension question should be asked, No general question)

BCA-106.COMMUNICATION AND SOFT SKILLS

Essentials of Grammar: Parts of Speech, Punctuation, Vocabulary Building, Phonetics

Office Management : Types of Correspondence, Receipt and Dispatch of Mail, Filing Systems, Classification of Mail. ,Role & Function of Correspondence, MIS, Managing Computer

Letter & Resume Writing: Types of Letters-Formal / Informal, Importance and Function, Drafting the Applications, Elements of Structure, Preparing the Resume, Do's & Don'ts of Resume, Helpful Hints

Presentation Skills: Importance of Presentation Skills, Capturing Data, Voice & Picture Integration, Guidelines to make Presentation Interesting, Body Language, Voice Modulation, Audience Awareness, Presentation Plan, Visual Aids, Forms of Layout, Styles of Presentation.

Interview Preparation: Types of Interview, Preparing for the Interviews, Attending the Interview, Interview Process, Employers Expectations, General Etiquette, Dressing Sense, Postures & Gestures

Group Discussion & Presentation: Definition, Process, Guidelines, Helpful Expressions, Evaluation

(Note: Every student shall be given 15 minutes. of presentation time & 45 minutes of discussion on his/ her presentation.)

The student will be evaluated on the basis of :

- his / her presentation style
- Feedback of Faculty & Students
- General Etiquette
- Proficiency in Letter Drafting / Interview Preparation

- The paper is internal and at least 3 tests will be taken. Best 2 of 3 shall account for final grades (70% Test & 30% Presentation)

SEMESER -2

BCA-201.PRINCIPLES OF MANAGEMENT

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I
Forms of business organizations and ownership: Sole proprietorship, Partnership, Joint stock company, Public & Private undertakings, Government companies.
Management: Meaning & definition of management, nature, scope and its various functions.

Section II
Planning : nature and purpose, types, steps in planning ,decision making : Strategic , tactical and operational decision, decision making process, rationality in decision making.
Organizing : nature, importance, the organizing process, organizational objectives, formal and informal organization, organization chart, span of management : factors determining effective span, Departmentation : definition, departmentation by function, by territory, product/service customer group ; management by objectives (MBO), Delegation, Decentralization v/s centralization.

Section III

Staffing : definition, manpower management, factors affecting staffing, Recruitment and selection , Performance appraisal .
Motivation: theories of Motivation; hierarchy of needs theory, theory of X and theory of Y.
Leadership : styles, theories of leadership : trait approach and situational approach, managerial grid.
Controlling : meaning & nature , steps in controlling , essentials of effective control systems.

BCA-202.SYSTEM ANALYSIS AND DESIGN

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

System Concepts: Definition, characteristics, elements & types of system.
System development life cycle: Recognition of need: Feasibility study
Section II
system analysis-introduction, information collection, interviews, questionnaires, observation, record searching and document analysis, analysis tools, data flow diagram, data dictionary, decision tree, structured English and decision table.

Section III
System Design: The process and stages of systems design, input/output and file design;
System Implementation:
System implementation, system testing, implementation process and implementation methods; system maintenance.

BCA-203.MATH-I (DISCRETE MATHS)

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Set theory. Relations and functions: Set notations and description, subsets, basic set operations. Venn diagrams, laws of set theory, partition of sets, min sets, duality principle, basic definitions of relations and functions, graphics of relations, properties of relations; injective, surjective and bijective functions, composition.

Section II

Combinations: Rule of products, permutations, combinations.

Algebra of Logic: Propositions and logic operations, truth tables and propositions generated by set, equivalence and implication laws of logic, mathematical system, and propositions over a universe, mathematical induction, quantifiers.

Recursion and recurrence: The many faces of recursion, recurrence, relations, and some common recurrence relations, generating functions.

Section III

Graph theory: Various types of graphics, simple and multigraphs, directed and undirected graphs, Eulerian and Hamiltonian graph, graph connectivity, traversals, graph optimizations, Graph coloring, trees, spanning trees, rooted trees, binary trees.

BCA-204.DATA STRUCTURES

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Introduction to Data Structure: Basic concept of data, Problem analysis , algorithm complexity, Big O notation and time space trade off.

Stacks & Queues : Basics of stacks and queues, Recursion, Polish notation, circular Queues, priority Queues.

Section II

Linked Lists : Single linked list, circular linked list, doubly linked list and dynamic storage management, generalized list, Garbage Collection.

Trees : Definition & Concepts, Basic trees, Binary tree representations, threaded storage representation, binary tree traversals, and application of trees.

Section III

Searching and sorting : use of various data structures for searching and sorting, linear and binary search, insertion sort, selection sort, merge sort, bubble sort, quick sort, Heap sort.

BCA-205.DIGITAL CIRCUITS & LOGIC DESIGN

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Introduction : Overview of number system and codes. Elements and functions of digital Logic gates, Gate propagation delay time, logic gates, Gate propagation delay time, and logic gate applications.

Boolean algebra: Boolean operations, SOP and POS forms, and simplification using karnaugh maps, Realization of expressions using goals.

Section II

Combinational logical circuits: design of Binary Adder-Serial, Parallel, Carry look ahead type. Full subtractor, code converters, MUX and DEMUX, encoders and encoders.

Sequential logic circuits: Flip flop: R-S, J-K, Master slave J-K, D and T flip-flops using nand gates.

Section III

Counters: Design of asynchronous and synchronous, updown and programmable counters.

Registers: shift registers, various types and their applications.

Detection and correction codes, detecting and correcting an error.

SEMESER -3

BCA-301.MATHS - II (COMPUTER ORIENTED METHODS)

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I
Matrix Algebra: Introduction of a matrix, its different kinds, matrix addition and scalar multiplication, Multiplication of matrices, Square matrix, Rank of a matrix, Transpose, Adjoint and Inverse of a matrix
Solving simultaneous equations using Gauss elimination method, Gauss Jorden Method and matrix inversion method
Section II
Statistics : Measures of central tendency. Preparing frequency distribution table, arithmetic mean, geometric mean, harmonic mean, median and mode. Measures of dispersion: Range, mean deviation, standard deviation, co-efficient of variation, moments, Skewness and Kurtosis
Differential Calculus: Introduction, Differentiation, Derivative of a Function of One Variable, Power Function, Sum and Product of Two Functions, Function of a Function, Differentiation by method of substitution, Maxima and Minima
Section III
Integral Calculus: Indefinite Integral, Integration by substitution, integration by parts,, Integration by partial fractions, definite integral.

Numerical integration : Trapezoidal method, simpson's 1/3 rule, simpson's 3/8 rule.

BCA-302.MANAGEMENT INFORMATION SYSTEM

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I
Introduction to Systems and Basic Systems Concepts, Types of Systems, The Systems Approach, Information Systems: Definition & Characteristics, Types of Information, Role of Information in Decision - Making, Sub - Systems of an Information system: EDP and MIS, management levels, EDP/MIS/DSS.

Section II

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

Section III

Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation, Pitfalls in MIS Development.

Functional MIS: A Study of Marketing, Personnel, Financial and Production MIS.

BCA-303.SOFTWARE ENGINEERING

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Software: Characteristics, Components, Applications, Software Process Models: Waterfall, Spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role of Metrics & Measurements.

S/W Project Planning: Objectives, Decomposition techniques: S/W Sizing, Problem-based estimation, Process based estimation, Cost Estimation Models: COCOMO Model, The S/W Equation,

Section II

System Analysis: Principles of Structured Analysis, Requirement analysis, DFD, Entity Relationship diagram, Data dictionary.

S/W Design: Objectives, Principles, Concepts, Design methodologies: Data design, Architectural design, procedural design, Object -oriented concepts

Section III

Testing fundamentals: Objectives, principles, testability, Test cases: White box & Black box testing, Testing strategies: verification & validation, unit test, integration testing, validation testing, system testing

BCA-304.OBJECT ORIENTED PROGRAMMING USING C++

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I
Introduction: Object oriented programming, characteristics of object orientated languages, classes, C++ basics: Program Statements, Variables and constants, Loops and Decisions.
Functions: Defining a function, function arguments & passing by value, arrays & pointers, function & strings, functions & structures.
Section II
Classes & Objects: Defining class, class constructors and destructors, operator overloading.
Class Inheritance: Derived class & base class; Virtual, Friends and Static functions; Multiple inheritance, Polymorphism.
Section III
Input/output files: Streams, buffers & iostreams, header files, redirection, file input and output.

BCA-305.INTRODUCTION TO MICROPROCESSOR

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I
Introduction to Microprocessor, its historical background and its applications.
INTEL 8085
Introduction, Microprocessor Architecture and its operations, 8085 MPU and its architecture,8085 instruction cycle ,8085 Instructions :Data Transfer instructions,

Arithmetic instructions, logical instructions, Branch instructions,RISC v/s CISC processors.

Section II

INTEL 8086

Introduction, 8086Architecture,real and Protected mode memory Addressing, Memory Paging Addressing Modes.

Various types of instructions: Data movement, Arithmetic and logic; and program control. Type of instructions, Pin diagram of 8086, clock generator (8284A)

Section III

INTERRUPTS:

Introduction, 8257 Interrupt controller, basic DMA operation and 8237 DMA Controller, Arithmetic coprocessor, 80X87 Architecture.

SEMESER -4

BCA-401.COMPUTER NETWORKS

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Data communications concepts: Digital and analog parallel and serial synchronous and asynchronous, simplex, half duplex, duplex, multiplexing.

Communication channels: Wired transmissions: Telephone lines, leased lines, switch line, coaxial cables-base band, broadband, optical fiber transmission.

Section II

Wireless transmission: Microwave transmission, infrared transmission, laser transmission, radio transmission, and satellite transmission.

Communication switching techniques; Circuit switching, message switching, packet switching.

Network reference models; Network topologies, OSI references model, TCP/IP reference model, comparison of OSI and TCI reference model.

Section III

Data link layer design issue: Services provided to the network layer, framing, error control, flow control HDLC, SDLC, data link layer in the internet (SLIP, PPP).

MAC sub layer: CSMA/CD, IEEE standards, FDM, TDM, CDMA.

The Network Layer: Design Issues, Routing Algorithms: Optimality principled, shortest path routing, Concept of Internet Working.

BCA-402.DATA BASE MANAGEMENT SYSTEM

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

An overview of the DBMS: Concept of database system, Database Administrator and his responsibilities. Physical and Logical data independence. Three level Architecture of database system: the external level, conceptual level and the internal level.
Introduction to Data Models: Entity Relationship Model, Hierarchical, Network and Relational Model. Comparison of Network, Hierarchical and Relational Model.

Section II

Relational data model: Relational database, relational algebra and calculus, SQL dependencies, functional, multi-valued and join, normalization.

Section III

Database protection: Recovery, concurrency, security, integrity and control.
Distribute database: Structure of distributed database, design of distributed databases.

BCA-403.COMPUTER SYSTEM ARCHITECTURE

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Computer Organization & Design: Instruction codes, op-codes, Computer Registers, Computer
Instructions, Timing and Control, Instruction Cycle, Memory reference instructions, CPU: Stack Organization, Instruction format, Addressing Formats.

Section II

Control Unit Architecture, I/O Architecture: Transfer of Information among I/O devices, CPU, Memory and I/O ports.

Section III
Memory System: Storage technologies, Memory hierarchy, Memory mapping, Main memory and Auxiliary memory, Associative and Cache memory
Introductory study of 8-bit Microprocessor

BCA-404.OPERATING SYSTEMS

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Introduction to Operating System, its need and Operating System services; Operating System classification - single user, multi-user, simple batch processing, Multiprogramming, Multitasking, Parallel system, Distributed system, Real time system.
Process Management : Process Concept, Process scheduling, Overview of Inter-Process communication,

Section II

CPU Scheduling : Basic concepts, Scheduling Criteria, Scheduling Algorithms.
Memory Management: Logical Versus Physical address space, Swapping Partition, paging and segmentation, concepts of Virtual Memory.
File Management: File concept, access methods, Directory Structure, file protection. Allocation methods: Contiguous, linked and index allocation.

Section III

Deadlocks: Deadlock Characteristics, Prevention, Avoidance, Detection and Recovery, critical section, synchronization hardware, semaphores, combined approach to deadlock handling.
Security: Authentication, Program Threats, System Threats, and Encryption.

BCA-405.WORKSHOP ON VISUAL BASIC

Develop an Application using Visual Basic
Bank transactions management
Hotel Management
Gas agency management
Office automation
Railway reservation
Computerisation course registration
Hostel management
Hospital management
Inventory management
Competitive examination database
Air line reservation
Transport management
College admission
Library management
Note: Any Relational Database System can be used as back end.

SEMESER -5

BCA-501.INTERNET APPLICATIONS AND JAVA

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Introduction: Internet Architecture board, understanding the internet.
Concept: Working, Surfing and security on the internet.
Internet protocols Internet addressing, internet routing protocols internet message protocol, internet group management protocols, internet mail protocol.
Internet applications: E-mail, multi cost backbone, net news.
Web: World Wide Web advantages of web, web terminology, web access using web browser, locating information on the web.

Section II

Introduction to Java: Applets, application & JDK, different b/w Java & C++, working with Java objects: Encapsulation, inheritance & polymorphism, constructors. Garbage collection & finalisers, data types, modifies & expressions, array & flow control statements.

Section III

Exception handling threads, event handling, network programming & Java virtual machines, Java & databases.

BCA-502.SYSTEM SOFTWARE

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Introduction to software processors; elements of assembly language programming; assembly scheme, single pass and two pass assembler; general design procedure of a two pass assembler.

Section II

Macros and Macro processor: macro definition, macro expansion, and features of macro facility, design of macro processor.
Overview of compilers - memory allocation, lexical analysis, syntax analysis, Intermediate code generation and optimization - local and global optimization, code generation.

Section III

Loaders and linkage editors: Introduction to Loading, linking and relocation, program linking, linkage editors, dynamic linking, bootstrap loader.
Other system software: Operating System, DBMS, Functions and structure of Text Editor.

BCA-503.COMPUTER GRAPHICS

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Input devices: Keyboard, Touch panel, light pens, Graphic tablets, Joysticks, Trackball, Data glove, Digitizers, Image scanner, Mouse, Voice & Systems.

Hard copy devices: Impact and non impact printers, such as line printer, dot matrix, laser, ink-jet, electrostatic, flatbed and drum plotters.

Section II

Video Display Devices Refresh cathode -ray tube, raster scan displays, random scan displays, color CRT-monitors, direct view storage tube, flat-panel displays; 3-D viewing devices, raster scan systems, random scan systems, graphics monitors and workstations.
Scan conversion algorithms for line, circle and ellipse, Bresenham's algorithms, area filling techniques, character generation.

Section III

2-dimensional Graphics: Cartesian and Homogeneous co-ordinate system, Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Two-dimensional viewing transformation and clipping (line, polygon and text).
3-dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Mathematics of Projections (parallel & perspective). 3-D viewing transformations and clipping.

BCA-504.OPERATION RESEARCH

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Origin & development of O.R., Nature & Characteristics features of O.R., Models & Modeling in Operation Research. Methodology of O.R., General methods for solving O.R. Models, O.R. & Decision making, Application, Use & Limitations of O.R.

Section II
Linear Programming: formulation, Graphical, Big MMethod & Simplex Method, Duality in L.P.: Conversion of Primal to Dual only
Transportation Problems: Test for Optimality, Degeneracy in Transportation Problems. Unbalanced Transportation, Assignment Problems, Traveling Salesman Problem.

Section III

Decision Making : Decision Making Environment, Decision under uncertainty, Decision under risk, Decision tree Analysis.

Integer Programming and Dynamic Programming: Concept and Advantages only.

SEMESER -6

BCA-601 ARTIFICIAL INTELLIGENCE

Section I

Introduction to AI: Definitions, AI problems, the underlying assumption, and AI techniques, Level of Model, Criteria for Success.

Problems, Problem Space and Search: defining the problem as a state space search, Production System, Problem Characteristics, Production System Characteristics, issues in design of search programs.

Section II

Knowledge Representation Issues: representation and mapping, approaches to knowledge representation, issues in knowledge representation, the frame problem.

Knowledge representation using predicate logic: representing simple facts in logic, representing instance and is a relationships, resolution

Section III

Weak -slot and -filler structures: semantic nets, frames as sets and instances.

Strong slot and filler structures: Conceptual dependency, scripts, CYC.

Natural language processing: syntactic processing, semantic analysis, discourse and pragmatic processing.

BCA-602.HANDING OPERATING SYSTEMS

INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each Section Ind Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

Section I

Handing Novel NetWare: Introduction, Installation, configuration, managing resources and users. Granting access rights to users.
Handing Windows NT Server:
Planning: Comparison of Microsoft OS (Windows 95, 98 NT workstation), Workgroups & Domains, choosing disk configuration, choosing Window NT protocols.

Section II

Installing & configuration Installing windows NT Server, Windows NT & registry, control panel, configuration protocols & bindings, network adapters, peripherals & devices, hard disk, printing & its client computer.

Section III
Managing resources: Managing users & group account, policies & profiles, system policy with system policy editor, disk resources, working with windows NT, the resources, UNC.
Connectivity: Inter operating with NetWare, Configuring remote access service.

BCA-603 .Software Lab – X (Major Project Phase – II)
Continuation of Major Project started in V semester (Code Generation, system testing, Installation and operations & maintenance)

BCA-607.Comprehensive Viva Voce

Viva of Full syllabus studied under BCA course.
Format of Project Report

- Title Cover
- Certificate from organozation about your stay (Project Duration) at that place and about submission of work done under external guide at the place of training.
- Certificate from your guide about the submission of work done under his/her guidance, Internal Supervisor.
- Table of Contents, abstract of the project (abstract of actual workdone).
- A brief overview of the organization (regarding function area, location, division in which you are working, turnover)
- Profile of problems assingned.
- Study of existing system, if any.
- System requirements
- Product Definition
- Problem Statement
- Function to be Provided
- Processing Environment: H/W, S/W.
- Solution Strategy
- Acceptance Criteria
- Feasibility Analysis
- Project Plan
- Team Structure
- Development Schedule
- Programming Languages And Development Tools

- System Requirement Specifications
- Developing / Operating / Maintenance Environments
- External Interface And Data Flows
- User display and report format, user command summary
- High level DFD and data dictionary
- Functional and performance specifications
- Design
- Detailed DFD's and structure diagrams
- Data structures, database and file specifications
- Pseudocode
- Test Plan
- Functional, Performance, Stress tests etc.
- Implementation / Conversion Plan
- Project Legacy
- Current status of project
- Remaining areas of concern
- Technical and managerial lessons learnt
- Future recommendations
- Bibliography
- Source Code (if available)

Note: - The above is meant to serve as a guideline for preparation of your project report. You may add to, modify or omit some of the above-mentioned points depending upon their relevance to your project. You may also consult your internal supervisor for the same.