

SEMESTER 2

BCA 201: ENGLISH (Common)

(Syllabus as approved by Board of Studies of English (UG)

BCA 202: MATHEMATICS(Complementary)

(Syllabus as approved by Board of Studies of Mathe Matics (UG)

BCA203: Accounting and Programming in COBOL (Core)

Unit-1 : Accounting Principles: Accounting concepts, conventions, Double Entry systems, Journal and Journalizing, Ledger- Posting and balancing, Trial balance

Unit 2 : Final accounts: Manufacturing account, Trading account, Profit and Loss account, Balance sheet.

Unit 3: Introduction to COBOL: History of COBOL, COBOL Coding sheet, Basic structure of COBOL programs, Character set, COBOL words and rules, Data names, Identifiers, Literals, Figurative constants, IDENTIFICATION DIVISION-entries, ENVIRONMENT DIVISION - CONFIGURATION SECTION, DATA DIVISION - WORKING-STORAGE SECTION - Level numbers and structure - data entries-VALUE clause, PICTURE clauses- Edited Picture clauses.

Unit 4: PROCEDURE DIVISION : Need for Paragraph, Input-Output Verbs DISPLAY and ACCEPT, Data Movement Verb MOVE, Arithmetic verbs- ADD, SUBTRACT, MULTIPLY, DIVIDE, COMPUTE- ROUNDED option - ON SIZE ERROR option, Operator precedence, conditional verb-IF statement, IF-ELSE statement, Nested IF statement, Conditions in IF statement- class, sign, relational, negated, compound, condition name condition, Sequence control verbs-GO TO, STOP RUN, CORRESPONDING option MOVE ADD - SUBTRACT, Table Handling- Arrays and subscripting- one, two dimensional tables, PERFORM statement - five different formats, GO TO with DEPENDING ON option. Programs based on above verbs.

Unit 5: SEQUENTIAL FILES AND FILE PROGRAMS :Various types of files, File program entries in various divisions- ENVIRONMENT DIVISION, INPUT-OUTPUT SECTION- DATA DIVISION- FILE SECTION entries- Level numbers, Level indicators- FD - SD, FILLER clause, PROCEDURE DIVISION for sequential files- OPEN, READ, WRITE, REWRITE, CLOSE verbs, various File opening modes- INPUT, OUTPUT, EXTEND and I-O modes, Simple SORT verb, Simple MERGE verb, Detailed structure of COBOL programs, SEQUENTIAL FILE program including sorting and merging. Concept of Indexed sequential file and Random access files.

Book of study:

1. Financial Accounting: Balakrishnan Nair.
2. COBOL Programming: M.K Roy, D.G Dastidar, - Tata McGraw Hill Second Edition.

References:

1. Accountancy : S P Jain , K L Narang
2. Advanced Accountancy (Vol.1) : S N Maheshwari, S K Maheshwari

BCA204 : Data Structures (Core)**Unit 1:**

Concept of Structured data: Data structure definition, Different types and classification of data structures, Arrays representation of array in the memory, linear array operations, Bubble sort, Selection sort, linear search, binary search, sparse matrix.

Unit 2: Stacks and Queues: organization and operation on stacks Conversion between infix to postfix & prefix representations- Expression Evaluation - Organization and operations on queues-circular queue-multiple stacks and queue - Applications of stacks and queues.

Unit 3:

Linked list: Concept of dynamic data structures, linked list, types of linked list, linked list using pointers, insertion and deletion examples, circular list doubly linked lists, garbage collection.

Unit 4:

Trees: Concept of recursion, definition of - trees, binary trees, strictly binary trees, complete binary tree and Binary search tree, Creation of binary search tree, traversing methods - examples.

Unit 5:

File organization: File organizations- sequential, random files, linked organization, inverted files, cellular partitioning, hashing function

Book of study :

Data Structures Through C (A Practical Approach), G.S Baluja
Danapat Rai & Co.

Fundamentals of Data Structures, Ellis Horowitz and Sartaj Sajni
Galgotia Publications

References:

Introduction to data structures in C , Ashok N. Kamthane, Person Education
Theory and Problems of Data Structures, Schaums Outline Series, Seymour
Lipschutz
Data structures using c and C++ , Tanenbaum

BCA205 : Fundamentals of Digital Systems (Core)

Unit 1:

Number Systems: Base of a number system, Positional number system, Popular number systems(Decimal, Binary, Octal and Hexadecimal), Counting in binary number system, Conversion-Decimal to Binary, Binary to Decimal, Decimal to Octal, Octal to decimal and binary, Decimal to hexadecimal, Hexadecimal to decimal, Binary and octal, Concept of binary addition and subtraction, Complements in binary number systems, 1^s Complement, 2^s Complement and their applications, Number representation in memory- bi-stable devices, Signed magnitude form, Representation of real numbers, BCD numbers- concept and addition, Concept of parity bit.

Unit 2:

Boolean Algebra and Gate Networks: Logic gates- AND, OR, NOT, NAND and NOR Truth tables and graphical representation, Basic laws of Boolean Algebra, Simplification of Expressions, De Morgans theorems, Dual expressions, Canonical expressions, Min terms and Max terms, SOP and POS expressions, Simplification of expression using K-MAP (up to 4 variables), Representation of simplified expressions using NAND/NOR Gates, Dont care conditions, XOR and its applications, parity generator and checker.

Unit3:-

Sequential and Combinational Logic. Flip flops- Latch, Clocked, RS, JK, T, D and Master slave , Triggering of flip flops , Counters- Synchronous and asynchronous , BCD, Ripple counters, Half adder, Full adder(need and circuit diagram), Encoders, Decodes, Multiplexers and Demultiplexers(working of each with diagram), Analog to digital and digital to analog converters (Diagram and working principle).

Unit 4:-

The Memory Elements: Concept of Registers, Shift Registers, Flip flops as building blocks of memory, RAM, ROM, organization .

Book of study :

M.M.Mano-Digital Logic and Computer design

References:

1. Thomas C Bartee- Digital computer Fundamentals
2. Floyd- Digital Electronics
3. Malvino & Leach- Digital Principles and Applications

BCA206 : Software Lab II (Core)

(There will be two questions; the first from COBOL and second from Data structures.)

Business Data Processing Using COBOL (only business problems)

(2 hours per week)

1. Programs using ADD, SUBTRACT, MULTIPLY, DIVIDE, COMPUTE VERBS
2. Programs using IF, IF.. ELSE, GO TO statements
3. Programs using PERFORM statements.
4. Programs using sequential file processing only Accounting problems are to be given as listed below.

- i) To create a sequential file to store journal entries. The structure of the file may be Date, Account Name to be debited, Account Name to be credited, Amount.
- ii) Using the journal file created above, display total debit amount, total credit amount, Debit balance or credit balance for a particular account name entered through the keyboard. (Balance is the Difference of debit total and credit total Debit balance when debit total exceeds credit total, Credit balance otherwise)
- iii) Preparing a sequential file containing Salary statement using an input file containing employee pay details.
- iv) To Display the summary of total deposits and total withdrawals in a day using a bank transaction file containing date, Account no, Type of transaction (D-deposit, W-withdrawal) and Amount.
- v) Preparing Electricity Bill using a sequential file containing Consumer No, Name, Previous Reading and Current Reading. An appropriate tariff structure may be assumed.

II. Data Structures using C. (3 hours per week)

1. Array search and sort Bubble sort, Selection sort, linear search, binary search, sparse matrix, polynomial addition.
2. Stack implementation, Application of stacks Conversion of infix expression to postfix, expression evaluation.

- 3.** Queue implementation, Implementation of circular queue.
- 4.** Linked list-implementation, concatenation etc., circular list and doubly linked list implementation, implementation of stacks and queue using linked lists.
- 5.** Creation and traversal of binary search trees.