FIRST YEAR B.SC. COMPUTER SCIENCE

Paper-I : Introduction to Information Technology

UNIT- I

Computer Basics : Introduction , Evolution of Computers, Generations of Computers ,Classification of Computers. The Computer system : Components of a Computer system ,Communication among various Units. Applications of computers.

UNIT- II

Computer Memory : Memory Hierarchy, Different Types of RAM & ROM.

System software : Introduction to system software, Distinction between systems software and Application software. Introductory ideas of loaders and linkers Computer language, Assemblers, Compilers and Interpreters.

UNIT- III

Operating systems : Evolution, introduction to OS , functions and facilities, single tasking and multitasking OS , single user and multi-user OS, characteristics of MS-DOS and Unix operating systems , DOS and UNIX commands for file and process management.

UNIT- IV

Text editors: overview of editing process

Graphical User Interfaces: Introduction to Windows, Word processing software packages and features, spread sheet packages and features,Working with Presentation packages.

UNIT- V

Computer Communications**:** Computer to computer communication through networking, Introduction to computer networks and networking software, Types of Networks, Internet and Intranet , Electronic mail. World Wide Web, URL ,Web browsers ,Search engine , Multimedia and Virtual reality. E-Commerce , Global Positioning System. Specifications of a typical desktop computer system, Recent Developments in ICT

Recommended books:

1. **Satish Jain : Information Technology**
2. **Alexis Leon : Fundamentals Of Information Technology**
3. **V.Rajaraman : Fundamentals of Computers**

Paper-II : Problem Solving Through C Programming

UNIT - I

Algorithm development: Definition and properties of algorithms, flow charts symbols, Types of flow chart, testing and debugging, Example of simple algorithms and flow chart. Program Development Cycle, Program design, Errors : syntax error , runtime error, logical error.

UNIT – II

Programming in C: structure of C programs, compilation and execution of C programs, character set, keywords, data types , constants, symbolic constants and variables, expressions. Operators : Assignment , Arithmetic , Relational , Logical, Conditional , comma , Increment/ Decrement, Bitwise, sizeof operator , Compound assignment operators. Associativity and precedence of C operators. Input/ output statements. Control statements - if-else, switch.

UNIT – III

Loops - for, while, do-while .Nested loops and combined loops.

Break and Continue statements.

C preprocessor : Symbolic constants, macro substitution - Simple, Augmented , Nested.

UNIT – IV

Functions: built-in and user-defined functions, function declaration , Advantages of user-defined functions. Category of functions. parameter passing- call by value & call by reference, recursive functions.

Array: Creating of one dimensional array, initialization , Accessing elements of 1 D array. Two dimensional array ,initialization , Accessing elements of 2D array.

Array and strings, string-handling functions.

UNIT – V

Pointers: pointer variable and its importance, pointer arithmetic, array of pointers, function of pointers, structure of pointers, dynamic memory allocation functions.

Structures and Union : Declaration of structures, initialization and accessing structure members. Function and structures , Array of structure, self-referential structure, unions, enumeration.

File Input/Output – Create, Open, Read, Write, Delete, Close.

Recommended books :

1. **Programming with C :- Schaum's outline Series**
2. **Programming with C :- E. Balagurusamy**

Paper-III : Digital Electronics

UNIT - I

Positional Number System : . Binary, decimal, octal and Hexadecimal number system. conversion from one base to another base. Representation of positive and negative integers, Real numbers,Characters.

Digital codes : weighted binary code, Non weighted code, Gray code. Binary to Gray conversion, Gray to binary conversion. BCD code. Binary Arithmetic in 1's and 2's complement.

UNIT - II

Boolean Algebra : Binary valued quantities, Logical Operations, Basic postulates of Boolean Algebra, Principle of Duality , Basic theorems of Boolean algebra , De- Morgan's Theorem. Finding complements of Boolean expressions. Minterm and Maxterm of Boolean Function.

Simplifications of SOP Boolean expressions using karnaugh map - 3 variables Boolean function, 4 variables Boolean Function.

UNIT - III

Basic Logic Gate, Universal Logic gate , Exclusive -OR, Equvalence OR gates.

Combinational Circuits : Half Adder , Full Adder, Parallel Binary Adder, Subtractor, Comparator , Decoder , Encoder , Multiplexer , Demultiplexer.

UNIT - IV

Combinational versus Synchronous circuits.

Flip Flop : Edge Triggered verus Pulse Triggered Flip Flop, S-R , D , J-K , T edge triggered Flip flop. J-K Master slave Flip flop

UNIT - V

Shift Register: Shift Register Function , Serial and Parallel Shift registers , Bi-directional Shift registers.

Counters : Asynchronous and Synchronous counters, Up/Down Counters, Decade Counters.

Recommended Books :

1. **Digital Fundamentals :-Thomas L. Floyd**
2. **Digital Logic and Computer Design :- Mano M.M.**

PAPER - IV : PRACTICALS

NOTE : Students are required to perform all the experiments selecting one from each part.

MARKS DISTRIBUTION

PART - A	**: 20**
PART - B	**: 20**
PART -C (POWERPOINT REPRESNTATION)	**: 10**
VIVA	**: 10**
Two RECORDS (Topic covered Part-A & part-B)	**: 15**

PART - A

1. Programs based on C operators - Arithmetic , Relational , Conditional , sizeof , Logical , Bitwise, Increment /Decrement Operators
2. Programs based on to calculate the lvalue of the given Formulas. For Exp.
   - Compute area and circumference of a circle.
   - Compute surface area and volume of a sphere.
   - Compute sum of digit of 4 digit numbers.
   - Compute simple and compound interest.
   - Compute find distance between two points.
3. Programs based on Conversion formula. For exp.
   - Fahrenheit to Celsius conversion.
   - Convert seconds to hours, minutes and seconds.
   - Convert centimetre to meter , inches.
4. Program based on selective structure.
   - Using simple if .. else statements
   - Using Nested if .. else statements.
   - Using else .. if ladder.
   - Using Switch statements.
5. Program based on Repetitive structure.
   - Using while Loop.
   - Using do .. while loop.
   - Using for loop.
   - Using combined loop.
   - Using nested loops
6. Programs using break and continue statements within loop.
7. Programs Using 1D Array. For Exp.
   - Program create read and write 1D Array.
   - Linear search in 1D Array.
   - Find largest and Smallest from 1D Array.
   - Sorting the 1D Array.
8. Programs Using 2D Array. For Exp.
   - Program to create read and print m* n matrix.
   - Program add ,subtract & multiply two matrices.
   - Program to add row and column total.
   - To change diagonal of square matrix.
9. Programs using string handling function.
10. Programs using functions.
    - Using function and array.

Using recursive function.
Using call by value and call by reference.
Using function with arguments no return values.
Using function with arguments with return values.

11. Program using Pointers.
    Using pointer arithmetic.
    Using pointer and 1D array.
    Using pointer and functions.
12. Programs using structure.
    Create and print the structure of book, football team, date etc.
    Program using structure and function.
    Program using array of structure.
13. Program using C preprocessor.
14. Program based on files.
    Using File management commands.
    To display contents of a file.
    To copy contents of a file from one to another

PART - B

1. Logic circuit and the function of basic logic gates and verify their truth tables.
2. Logic circuit and the function of universal gates.
3. Logic circuit and the fuction of XOR and XNOR gates.
4. To study the different logical expressions and their simplification.
5. To familiarize and verify the Boolean algebraic functions.
6. Conversion of positional number system from one base to another base.
7. Binary to gray and gray to binary code conversion.
8. Karnaugh map simplifications related Boolean functions.
9. Finding the Maxterm of Boolean function.
10. Finding the Minterm of Boolean function.
11. conversion of maxterm to minterm and vice versa.
12. Logic circuit and working of half adder.
13. Logic circuit and working of Full adder.
14. Logic circuit and working of parallel binary adder.
15. Logic circuit and working of Decoder circuits.(BCD to Decimal)
16. Logic circuit and working of encoder circuits.(Decimal to BCD)
17. Logic circuit and working of multiplexer.(4 X1) (8 X 1)
18. Logic circuit and working of demultiplexer (1 X 4) (1 x8)
19. Logic circuit and working of Edge Triggered Flip flops circuits.
    S-R , D , J-K , T
20. Logic circuit and working of Master Slave Flip Flop circuits.
21. Logic circuit and working of Shift registers.
    serial , parallel and Bi directional.
22. Logic circuit and working of Counters.
    Asynchronous , Synchronous and Up/down , Decade Counters.

PART - C

Power point presentation on the topics covered in Paper -I , Paper - II ,Paper -III as assigned by the concerned teacher.