

**B.Sc. I YEAR COMPUTER SCIENCE
PAPER I: (FUNDAMENTALS OF COMPUTERS)**

Max Marks : 40

Min Marks:14

UNIT I

Block diagram of computer: input unit, output unit, CPU, memory unit, generations of computers, types of Computers: desktop, laptop, palmtop, and workstations & super computers. All types of input and output devices. hardware, software and firmware.

Windows: features of windows – desktop, start menu, control panel, my computer, windows explorer, accessories. Managing multiple windows, arranging icons on the desktop, creating and managing folders, managing files and drives, logging off and shutting down windows.

UNIT II

Word: What is word processing, creating documents in MS-Word, formatting features of MS-Word, standard toolbar, drawing toolbar, tables and other features. Mail-merge, insertion of files, pictures, clipboard, graphs, print formatting, page numbering and printing documents.

Excel - Introduction to workbook and worksheet. Entering information in a worksheet - numbers, formula, etc., saving a workbook, editing cells, using commands and functions, moving and copying, inserting and deleting rows and columns, creating charts. Page setup: margins, adding headers & footers before printing, print preview of worksheet, removing grid lines from printout, printing the title rows.

UNIT III

Number system: decimal, binary, octal, hexadecimal, conversions from one base to another base. Codes: ASCII code, EBCDIC code, Gray code. Boolean algebra, De - Morgan's theorem, binary arithmetic: - addition, subtraction, multiplication & division, unsigned binary numbers, signed magnitude numbers, 1's complement & 2's complement representation of numbers, 2's complement arithmetic. Boolean functions & truth tables, SOP, POS form, minterms /maxterms, simplification of logic circuits using boolean algebra and Karnaugh maps. Logic gates: - AND, OR, NOT, NAND, NOR, X -OR and X -NOR gates, their symbols and truth tables, circuit design with gates: adder/subtractor circuit.

UNIT IV

Memory cell, primary memory: RAM, static and dynamic RAM, ROM, PROM, EPROM, EEPROM , cache memory, secondary memory and its types, virtual memory concept, memory accessing methods: serial and random access. Data bus, control bus & address bus. Word length of a computer, memory addressing capability of a CPU ,processing speed of a computer, microprocessors, single chip microcomputers (microcontrollers).

UNIT V

General architecture of a CPU, instruction format, and data transfer instructions, data manipulation instructions and program control instructions. Types of CPU organization: accumulator based machine, stack based machine and general- purpose register based machine, addressing modes, data transfer schemes: (i) programmed data transfer: synchronous, asynchronous and interrupt driver data transfer (ii) direct memory access data transfer: Cycle stealing block transfer and burst mode of data transfer.

Text book

1. Digital logic and Computer Design by Malvino leach.
2. Computer System Architecture by M Morris Mano.
3. PC Software for Windows by R.K.Taxali.
4. Fundamentals of computers by P.K.Sinha.
5. Computer Organization and Architecture by Stallings.
6. Computer today by Suresh K.Basandra.
7. Computers Fundamentals and Architecture by B.Ram.

Suggested list of practical in MS-Word & Excel:

1. Create a banner of college using MS-Word.
2. Design a greeting card using WORD ART.
3. Create your biodata and use page borders and shading in MS-Word.
4. Create a document, insert header, footer, page title, page number using MS-Word.
5. Implement Mail-merge.
6. Insert table in MS-Word document.
7. Create a marksheet using MS-Excel.
8. Creation and printing of types of graphs in Excel.
9. Built-in functions in Excel.
10. Create Faculty Time table.

PAPER II: (PROGRAMMING IN C)

Max Marks : 40

Min Marks:14

UNIT-I

Classification of programming language: procedural languages, problem oriented languages, non-procedural languages. Structured programming concepts: modular programming: top-down analysis, bottom-up analysis, structured programming. Problem solving using computers: problem definition and analysis, problem design, coding, compilation, debugging and testing, documentation, implementation and maintenance.

UNIT-II

Introduction to C language: constants, variables, keywords, data types, operators, expressions, operator precedence and associativity. Structure of C program: variable declaration, declaration of variable as constant.

UNIT-III

Managing input/output operators: formatted and unformatted. Control statements: branching, jumping & looping, scope rules, storage classes.

UNIT-IV

Arrays (one and two dimensional). Functions: user defined function, standard function, categories in functions, passing arguments to a function, recursion. Pointers: operators, declaration, pointer to arithmetic, array of pointers. Structures: declaring, accessing, initializing, array of structures.

UNIT-V

File handling in C: opening and closing a data file, inserting data to data file. Graphics programming- introduction, functions, stylish lines, drawing and filling images, palettes and colours, justifying text, bit of animation.

Text Books-

- How to solve it by Computers by R. G. Dromy, PHI.
- Let us C by Yashwant Kanetkar.
- ANSI C by E. Balagurusamy.
- Programming in C by S.S. Bhatia.

Reference Books-

- How to design Programs-An Introduction to programming and computing- Felleisen, PHI Publication.
- Introduction to Algorithms by Cormen, PHI.
- Programming in C: Denis Richie.

Suggested list of programs for practical

1. Write a program to print digits of entered number in reverse order.
2. Write a program to print sum of two matrices.
3. Write a program to print subtraction of two matrices.
4. Write a program to print multiplication of two matrices.
5. Write a program to demonstrate concept of structure.
6. Write a program for finding the root of a Quadratic Equation .
7. Write a program for Marksheet.
8. Write a program for finding the sum of given matrices of order $m \times n$.
9. Write a program for finding the multiplication of given matrices of order $m \times n$.
10. Write a program to generate even/odd series from 1 to 100.
11. Write a program to find area of a circle, rectangle, square using case.
12. Write a program to check whether a given number is even or odd.
13. Write a program whether a given number is prime or not.
14. Write a program for call by value and call by reference.
15. Write a recursive program to calculate factorial of a given number.
16. Write a program to generate a series
 $1 + 1/1! + 2/2! + 3/3! + \dots + n/n!$
17. Write a program to create a pyramid structure

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18. Write a program to create a pyramid structure

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1
12
123
1234

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19. Write a program to create a pyramid structure

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1
22
333
4444

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20. Write a program to reverse a string.
21. Write a program to find whether a given string is PALINDROME or not.
22. Write a program to input 10 numbers add it and find it's average.
23. Write a program to generate series
 $1 + 1/2! + 1/3! + \dots + 1/n!$
24. WAP to print table of any number.
25. WAP to print Fibonacci series
26. WAP to find length of string without using function.
27. WAP to perform all arithmetic operations using case statement.

B.Sc. II YEAR COMPUTER SCIENCE
PAPER I:(OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++)

Max Marks : 40

Min Marks:14

UNIT I

Introduction to C++: programming paradigms, key concepts of object-oriented programming, advantages of Oop's. Input and output in C++: unformatted console I/O operations, formatted console I/O operations.

UNIT-II

Structure of C++ program, types of tokens, keywords, identifiers, data types, constants, operators, precedence of operators, referencing and dereferencing operators, scope Resolution operator. Control structures: decision making statements, looping statement, break, continue, goto.

UNIT-III

Functions: main(), parts of function, passing arguments: value, address(reference), inline functions, function overloading, library functions. Classes and objects: declaring classes and objects, accessing class members using keyword: public, private, protected, defining member functions: member function inside the class, member function outside the class, static member variables and functions, friend function, friend classes, overloading member functions.

UNIT-IV

Constructors and Destructors: characteristics, constructors with arguments, overloading constructors, types of constructors. Operator overloading: overloading unary operator, binary operator. Inheritance: access specifiers: public inheritance, private inheritance, protected data with private inheritance, Types of inheritances: single, multiple, hierarchical, multilevel, hybrid, multipath.

UNIT-V

Pointers & arrays: pointer declaration, pointer to class & object, Array: declarations & initialization, arrays of classes. Polymorphism: Static (Early) binding, Dynamic (Late) Binding, virtual function, pure virtual function.

Text books:

Object-Oriented Programming with ANSI & Turbo C++ by Ashok N. Kamthane.
Object Oriented Programming in C++ by E. Balagurusamy

Reference Books:

C++ The complete Reference by Herbert Schildt, TMH publication.
Object Oriented Programming in C++ by Robert Lafore.

Suggested list of programs for practical

1. Write a program to find average of 3 numbers.
2. Write a program to find biggest among 3 numbers.
3. Write a menu driven program (Switch case) to perform arithmetic operations.
4. Write a program to check whether entered number is Prime or not.
5. Write a program to check whether entered number is even or odd.
6. Write a program for addition of two matrixes.
7. Write a program for multiplication of two matrixes.
8. Write a program to find transpose of a matrix.
9. Write a program to print :
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10. Write a program to print :
1
2 2
3 3 3
11. Write a program to print :
1
2 3
4 5 6
12. Write a program to check whether entered string is palindrome or not.
13. Write a program to print Fibonacci series.
14. Write a program to find factorial of a given number.
15. Write a program to demonstrate use of static data member.
16. Write a program to demonstrate use of a static member function.
17. Write a program to create array of objects.
18. Write a program to demonstrate use of friend function.
19. Write a program to illustrate use of copy constructor.
20. Write a program to demonstrate constructor overloading.
21. Write a program to illustrate use of destructor.
22. Write a program to overload a unary operator.
23. Write a program to overload a binary operator.
24. Write a program to demonstrate single Inheritance.
25. Write a program to demonstrate multiple Inheritance.
26. Write a program to demonstrate multilevel Inheritance.
27. Write a program to demonstrate hierarchical inheritance.
28. Write a program to demonstrate hybrid Inheritance.
29. Write a program to demonstrate the use of function overloading.
30. Write a program to demonstrate the use of inline member function.
31. Write a program to demonstrate the use of parameterized constructor.

**B.Sc. II YEAR COMPUTER SCIENCE
PAPER II: (DATA STRUCTURES)**

**Max Marks : 40
Marks:14**

Min

UNIT-I

Concept of data structure and analysis of algorithm, abstract data structure, introduction to stack and primitive operations on stack, stack as an abstract data type, stack application: infix, prefix, postfix and recursion, introduction to queues, primitive operation on queues, circular queue, dequeue , priority queue and applications of queue.

UNIT-II

Introduction to linked list, basic operations on linked list, stacks and queues using linked list, doubly linked list, circular linked list, applications of linked list.

UNIT-III

Trees-basic terminology ,binary trees, tree representations as array and linked list, basic operations on binary tree, traversal of binary trees:- inorder, preorder, postorder. Applications of binary tree, threaded binary tree, AVL tree, binary tree representations of trees.

UNIT-IV

Sequential search, binary search, insertion sort, selection sort, quick sort, bubble sort, heap sort, comparison of sorting methods.

UNIT-V

Hash Table, Collision resolution technique, Introduction to graphs, Definition, Terminology, Directed, Undirected and Weighted Graph, Representation of Graph, Graph Traversal-Depth first, Breadth first search, Spanning tree, Minimum Spanning tree, Shortest path algorithm.

Text Books-

Data Structure: By Lipschultz (Schaums Outline Series)

Data Structures through C (A Practical Approach) by G.S. Baluja

Data Structure: By Trembley & Sorrenson

Reference Books-

Fundamental of Data Structure By S.Sawhney& E. Horowitz

Suggested list of Programs for practical

1. Write a program to find the factorial of a given no using recursion.
2. Write a program for bubble sorting.
3. Write a program for linear search.
4. Write a program for binary search.
5. Write a program for selection sorting,
6. Write a program for quick sorting.
7. Write a program for insertion sorting.
8. Write a program to print Fibonacci series using recursion.
9. Write a program to perform insertion and deletion operation in the stack.
10. Write a program to perform insertion and deletion operation in the queue using static implementation.
11. Write a program to perform insertion and deletion operation in queue using dynamic implementation.
12. Write a program to insert a node at the beginning in singly linked list.
13. Write a program to insert a node at the middle in singly linked list.
14. Write a program to insert a node at the last in singly linked list.
15. Write a program to delete a node from the beginning in singly linked list.
16. Write a program to delete a node from the middle in the singly linked list.
17. Write a program to delete a node from the last in the singly linked list.
18. Write a program to traverse all the nodes in singly linked list.
19. Write a program to insert a node in the beginning in the circular linked list.
20. Write a program to insert a node at the last circular linked list.
21. Write a program to perform all the insertion operations in the singly linked list using switch case.
22. Write a program to perform all the deletion operations in the singly linked list using switch case.
23. Write a program to count the number of nodes in binary tree.
24. Write a program to evaluate postfix operation.
25. Write a program to convert infix operation to postfix operation.

B.Sc. III YEAR COMPUTER SCIENCE

PAPER I: (DATABASE MANAGEMENT SYSTEM & JAVA PROGRAMMING)

Max. Marks: 40

Min. Marks: 13

UNIT-I

Purpose of database system, views of data, data models: relation, network, hierarchical, instances and schemas, data dictionary, types of database languages:-DDL, DML, structure of DBMS, advantages and disadvantages of DBMS, 3-level architecture proposal:-external, conceptual & internal levels.

Entity relationship model as a tool of conceptual design: entities & entities set, relationship and relationship set, attributes and mapping constraints, ER diagram:-strong and weak entities, generalization, specialization & aggregation, reducing ER diagram to tables.

UNIT-II

Fundamentals of set theory: relations, domains, attributes, tuples, concept of various keys, fundamentals of integrity rules: entity & referential integrity, extension and intention, relational algebra: select, project, Cartesian product, different types of joins: theta, equi, natural, outer joins, set operations.

UNIT-III

Functional Dependencies, Good & Bad Decomposition and Anomalies as a database: A consequences of bad design, Universal relation, Normalization: 1NF, 2NF, 3NF &BCNF normal forms, multivalued dependency, join dependency, 4NF, 5NF.

Basic concepts: -Indexing and Hashing, B-tree Index files, Hashing: Static & Dynamic hash function, Index definition in SQL: Multiple key accesses.

UNIT-IV

Introduction of JAVA and its' features, Hardware and Software requirements, Java environments, Java virtual machine ,Java Program Structure, Java Tokens, Java statements, Implementations a Java Program, Constants, variables and data types, Operators, Control Statement, Array and Vector, Wrapper classes, Exceptions,

UNIT-V

Constructor in Java , Inheritance, Interfaces, Java Packages, Creating User Defined Package, Thread, life cycle of a Thread, Thread methods, Applet : Applet life Cycle, creating executable Applet, JDBC.

Text Books-

Database System Concepts by Henry Korth and A. Silberschatz.

Simplified approach to DBMS, Prateek Bhatia, Gurvinder Singh Kalyani Publication

Reference Books-

1. An Introduction to Database System by Bipin Desai
2. An Introduction to Database System by C.J.Date.
3. Object Oriented Programming by E. Balaguru swami

LIST OF PRACTICALS (ORACLE)

1. WAQ to insert some new records in emp table.
2. WAQ to list the number of employees whose name is not 'ford', 'jams' or 'jones,
3. WAQ to list the name and salary and sort them in descending order of their salary
4. WAQ to list the details of employees whose name is starts from 'a'
5. WAQ to delete all records from emp table
6. WAQ to insert values in 3 fields.
7. WAQ to list the student name having 'd' as second character.
8. WAQ to list the name and salary and sort them in descending order of their salary
9. WAQ to list the name and salary and sort them in descending order of their salary
10. WAQ in employee table find all the manager who earns between 1000 and 2000.
11. Display record of employee who have salary between 1000 and 2000.
12. List the name salary and department number of the employee and order them by their salary in descending order.
13. In employee table change the city of employee from existing one to new one.
14. Add a column salary of data type 'number' & having size '5' with default value 1000.
15. WAQ to find the employee who earns the lowest salary in each department. Display in ascending order of salary.
16. List the employee who earns maximum salary in their department. Find the name of all employee who works for 'first bank corporation'. Display the record of employee whose name start with 's' & age is greater than 18.
17. Find the name, street & city of residence of all employee who works for 'fbc'
18. WAQ to update the salary of employee number 1902 to Rs. 10,000
19. WAQ to find the name, street and city of all employee who works for 'fbc' and who earn more than 1000.
20. WAQ to increase the salary by 2000 and rename the column as "new salary"
21. WAQ to find the name, street and city of all employee who works for 'fbc' and who earn more than 1000.
22. WAQ to find total of salaries of all employees from emp table
23. WAQ to decrease the salary of emp from 5000 and rename column as 'newsalary'
24. List the employee number of employee who belone to department 10,20.
25. List the employee no of employees who earn greater than 2000
26. Insert new field called category in emp table.
27. Display different jobs in departments 20,30

28. List the names of employees having two 'aa' in the name
29. Print the name , emp no, sal of employees in emp table.
- 30 List the names of employees who do the job of clerks or salesman.

LIST Of PROGRAMS (Java)WAP in java to calculate of diagonal elements.

- WAP in java to print unit matrix.
- WAP in java to demonstrate creation of threads.
- WAP in java to demonstrate interface.
- WAP in java to demonstrate multiple interface defining interface.
- WAP in java to demonstrate packages.
- WAP in java to demonstrate applets.
- WAP in java to perform multiplication of two matrix.
- Write a menu driven program using switch in java.
- WAP in java to demonstrate multi threading.
- WAP in java to calculate sum of upper triangular elements of matrix.
- WAP in java to calculate sum of lower triangular elements of matrix.
- WAP in java to print digits of number in reverse order.
- WAP in java to check entered number is Armstrong or not.
- WAP in java to perform addition of matrix.
- WAP in java to perform subtraction of matrix.
- WAP in java to print table of any number in proper format.
- WAP in java to print following format.
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- WAP in java of swing using Action Listener.
- WAP in java to demonstrate labels and text field.

B.Sc. III YEAR COMPUTER SCIENCE

PAPER II:(OPERATING SYSTEM CONCEPTS)

Max. Marks: 40

Min. Marks:13

UNIT I

Operating system definitions, its components, evolution of operating system, types of operating systems: batch, multiprogramming, multitasking, multiprocessor, real time, client-server, peer-to-peer, distributed, clustered, operating system services, system calls.

UNIT II

Process scheduling: concept of a process, process states, PCB, process life cycle, types of schedulers, CPU burst- I/O burst cycles, dispatcher, scheduling criteria, scheduling algorithms – FCFS, SJF, STRN, Round Robin, priority, event driven, multilevel queue.

UNIT III

Memory Management: address binding, logical and physical address space, dynamic loading and linking. Contiguous memory allocation: static and dynamic partitioned memory, fragmentation, swapping relocation, compaction, protection. Non-contiguous memory allocation: Paging Segmentation. Virtual Memory: demand paging, page fault, page replacement algorithms- FIFO, LRU, optimal. Thrashing, page fault frequency.

UNIT IV

Interprocess communication need for synchronization, Deadlocks- definition, avoidance, prevention, detection and recovery. Disk organization, Directory structure, disk space management- contiguous and non-contiguous allocation strategies, disk address translation, disk caching, disk scheduling algorithms. Device Management: dedicated devices, shared devices. Security and protection: security threats and goals, penetration attempts. Security policies and mechanisms, authentication, protection and access control.

UNIT V

Linux: History and features of Linux, Linux architecture, file system of Linux, hardware requirements, Linux standard directories, Linux Kernel.
Working with Linux: KDE and Gnome graphical interface, various types of shells available in Linux. Vi editor, Linux commands. File security in Linux.

TEXT BOOKS AND REFERENCE BOOKS

1. Operating system Concepts: by Silberschatz, Galvin and Gagne.
2. Operating system Design and Concepts, by Milan Milenkovic
3. Operating system by Andrew Tanenbaum
4. Operating system by Peterson
5. Linux Bible by Christopher Negus
6. Linux by Sumitabh Das

Suggested Practical

Basic Linux Commands and vi editor