Sacs.3214          **Computer Programming and Data Structures (1+2)**          **Marks: 50**
**Time: 2 hours**

**I          Fill in the blanks                                                         (10x1=10)**
1. In C, the file containing function declarations and macro definitions is known as a ……….. file.
2. The process of converting high-level language code into machine code is done by the ……….
3. To explicitly change the data type of a value during expression evaluation, we use …………..
4. A pointer to a pointer is declared using the symbol …………..
5. The operator with the highest precedence among arithmetic operators is ………..

**State True or False**
6. The queue data structure operates on the principle of First In First Out (FIFO).
7. A pointer must be initialized with a valid memory address before dereferencing.
8. Pointers can be used to access multidimensional arrays.
9. The standard library function strlen() is used to compare two strings.
10. Recursive functions must always have a base condition to terminate recursion.

**II         Write short on ANY FIVE of the following                               (5x2=10)**
1. Explain the structure of a C program with an example.
2. What are the primary data types in C? Explain briefly.
3. Explain the concept of recursion with an example.
4. What is dynamic memory allocation? List two related functions.
5. Write a C function to count the number of vowels in a string using pointers.
6. Explain the stack implementation using arrays with push and pop functions.
7. Describe the concept of nested loops with an example to print a pattern.

**III        Answer ANY FIVE of the following                                       (5x4=20)**
1. Define a structure. Write a C program to manage student records using structures and functions (add, display, search).
2. Explain how precedence and associativity affect the evaluation of expressions in C.
3. What is meant by scope and lifetime of a variable? Illustrate with an example.
4. What are the limitations of arrays that linked lists overcome?
5. Describe how the switch statement works and mention one limitation.
6. Write a C program to accept a number and check if it is prime. Explain the logic used
7. What are user-defined functions? Mention their advantages.

**IV        Write an essay on ANY ONE of the following                             (1x10=10)**
1. What are tokens in C? Explain different types with examples.
2. Compare structures and unions with examples.

************************