Code No: 111AF **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year Examinations, January/February - 2024

COMPUTER PROGRAMMING

(Common to CE, EEE, ME, ECE, CSE, MIE)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

1.a)	Differentiate between a variable and a constant.	[2]
b)	Discuss the differences between the pre-increment and post-increment operators in C. Give examples for both of them.	[3]
c)	Discuss the role of the #define directive in the preprocessor.	[2]
d)	What is a user-defined function in C Provide an example?	[3]
e)	Explain the concept of the address-of operator (&) in relation to pointers.	[2]
f)	Explain the purpose of malloc () function in dynamic memory allocation.	[3]
g)	Discuss the role of the file pointer in file handling.	[2]
h)	Define an enumerated type in C. Provide an example of its usage.	[3]
i)	Write the time complexity of selection sort and bubble sort.	[2]
j)	Define a linear list and explain its significance in data structures.	[3]

PART - B

(50 Marks)

2.a)	Compare and contrast the if and switch statements in C.	
b)	Explain Bit-wise operators in C. Evaluate the bitwise AND operation for the given expression: a = 5 & 3.	[3+7]
	OR	
3.a)	Write a C program to display the first 10 natural numbers using a **while** loop.	
b)	Explain the difference between for and while loops.	[7+3]
4.a)	Explain the difference between a function declaration and a function definition. Write the significance of function prototypes in C.	
b)	Write a recursive function to calculate the factorial of a number.	[4+6]
	OR	
5.a)	When and where is the **extern** storage class typically used in C?	
b)	Write a program to transpose a matrix using arrays in C.	[4+6]

6.a) How are pointers used for inter-function communication in C?
b) How can pointers be used to traverse an array? [5+5]

OR

7.a) Discuss the difference between a character array and a string in C.
b) Write a program that finds the length of a string without using the strlen() function. [4+6]

8.a) Explain the advantages and limitations of using bit fields.
b) Write a program that uses structures to represent a book with title, author, and publication year. [4+6]

OR

9.a) Write a C program that copies the contents of one binary file to another.
b) Enumerate the key differences between text and binary file formats in C. [6+4]

10.a) Compare queues with stacks, highlighting their differences.
b) Discuss the applications of stacks. [4+6]

OR

11.a) Explain how to insert a new node at the end of a singly linked list.
b) Discuss the conditions under which binary search is effective. [6+4]

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