

Code No: 111AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech I Year Examinations, September - 2023****COMPUTER PROGRAMMING****(Common to CE, EEE, ME, ECE, CSE, AE, AME, MIE, PTM)****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) Consider the following code :

```
int main()
{
int a = 5, b = 6, c;
c = (++a) + (b << 2);
printf("a = %d , b = %d , c = %d \n", a, b, c);
}
```

What is the output of above code? Justify your answer with two to three lines of explanation.

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| b) Differentiate while loop and do-while loop. | [2] |
| c) Develop a recursive function to find factorial of a given number. | [3] |
| d) List different ways of initializing one dimensional array. | [2] |
| e) How you define a pointer to an array. Give an example for it. | [3] |
| f) How you declare a pointer to a function and how you call the function with the help that pointer variable? Give an example. | [2] |
| g) Differentiate binary files with text files. | [3] |
| h) Give an example of nested structure. | [2] |
| i) Discuss the push operation of stack. | [3] |
| j) List the applications of Queue data structure. | [2] |

PART - B**(50 Marks)**2.a) Discuss about bitwise operators in C Language. Consider the expression $X = 5 + 4 * 5 + a \ll 3$, where $a = 4$. Find the value of the variable X and also discuss about operator precedence and associativity in this context.

- b) Malathi has 3 bags that she wants to take on a flight. They weigh A, B, and C kgs respectively. She wants to check-in exactly two of these bags and carry the remaining one bag with her. The airline restrictions says that the total sum of the weights of the bags that are checked-in cannot exceed D kgs and the weight of the bag which is carried cannot exceed E kgs. Find if Malathi can take all the three bags on the flight. (Note:- Inputs the program are A, B, C, D, E)

[5+5]

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OR

- 3.a) Discuss about different data types in C Language.
b) Kattappa is great warrior in his time in Mahishmathi kingdom. He seems to be more superstitious person. He believes a soldier is lucky if he possesses even number of weapons and unlucky otherwise. He will be ready for the battles if number of lucky soldiers is strictly more than number of unlucky soldiers. Given number of soldiers and weapons they possess, develop C code to find whether Kattappa is ready for the battle or not. [5+5]

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- 4.a) Write a C program to read n values into an array and arrange them in increasing order.
b) Explain the types of arrays in C. [5+5]

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OR

- 5.a) List the limitations of recursive functions.
b) Explain different parameter passing mechanisms in C language. [5+5]

- 6.a) Explain the concept of passing array to function with an example.
b) Write a C program to verify a substring `str1` is present in another string `str2` or not? [5+5]

OR

- 7.a) Write a C program to check a given string is palindrome or not.
b) Discuss about different dynamic memory allocation functions. [5+5]

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- 8.a) Write a C program to define a structure called *employee*. Assume fields in this structure as *empid*, *empname*, *salary*. Read n employees information and print it as it is and also find average salary of all n employees.
b) Discuss about modes of opening a file. [5+5]

OR

- 9.a) Write a C code which reads two integers a , b ($a < b$) from a file with the name *file1*. Compute prime numbers in the range of a to b and write the result to another file called *file2*. Finally display the contents of *file2* to the console.
b) Write about self-referential structures. [5+5]

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- 10.a) Apply bubble sort on the following list of values : 4,1,7,9,11,34,21,45,22.
b) Write a C program to implement linear search. [5+5]

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OR

- 11.a) Give the concept of binary search with a suitable example.
b) Explain insert and delete operation in single linked list. [5+5]

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