U/E/TX

Reg. No:

VIT

Vellore Institute of Technology

Final Assessment Test – May 2024

Course: TCSE101L - Computer Programming : C

Class NBR(s): 3852 / 3858 Slot: G1

Time: Three Hours Max. Marks: 100

- KEEPING MOBILE PHONE/ELECTRONIC DEVICES EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer any TEN Questions

(10 X 10 = 100 Marks)

1. a) Explain in detail the structure of C program. [5]

   b) State the syntax of scanf() and printf() statements along with examples. [5]

2. Consider the following code segment:

   int a=7, b=2, c=1;

   float w=5, x=3.3, y=2;

   Evaluate the output for the following expressions:

   a) c += c+b*a/b; [2]

   b) c = a%b/w+x-c; [2]

   c) y= a<<3; [2]

   d) c= b&&a||c; [2]

   e) c= a^c; [2]

3. a) Write a C program to print the sum of n natural numbers. [5]

   b) Write a C program to print the first 10 Fibonacci numbers. [5]

4. Compute the ISD telephone bill per month according to the given conditions using C program: For the first 30 minutes – Free; For the next 120 minutes – Rs.0.5/minute; For the next 120 minutes – Rs.2.5/minute; For the minutes above 300 – Rs.5/Minute. An additional fixed monthly charge of Rs.250 is added to the bill. Get the usage minutes, previous dues and late fee from the user to produce the total current due amount after including a 9% GST.

5. Perform matrix multiplication between two matrices using a C program.

6. Use C program to perform the following task: Get the height (in cms) of five students from the user in an array and calculate the average height. Next, Sort the array and find the median height. Display both average and median heights. Finally compare the median height & average height and display the largest.

7. a) Illustrate recursive function with an example. [5]

   b) Differentiate call by value and call by reference concepts. [5]

8. Use C program for the following task:

Value of two integers A, B and one arithmetic operator should be received from the user and the output should be equal to (A!+B) when the operator is + (plus: addition). The output should be equal to (A!-B) when the operator is – (minus: subtraction). In the similar manner, multiplication and division operators also should be considered. Avoid the usage of math.h library function. Here '!' symbol represents factorial of a number.

Separate functions for the following tasks should be incorporated with Call by reference concept i.e., for all functions only address of a variable should be passed as arguments.

- A function for getting the value of inputs i.e., A, B & an arithmetic operator
- A function for calculating the factorial
- A function for computing the result

9. Write the steps involved in dynamic memory allocation while implementing reversing an array using pointers. Suitable functions should be used to build an array dynamically and to release the memory space after usage.

10. Design a C program to display the patients details like Name & patient ID along with the BMI category (Body Mass Index, BMI = kg/m^2). The structures should contain Name, patient_id, height and weight as structure members. Consider Array of structure variables for dealing with 'n' patients.

BMI Categories:

Underweight = <18.5

Normal weight = 18.5–24.9

Overweight = 25–29.9

Obesity = BMI of 30 or greater

11. Demonstrate the structure within structures with an example program related to student information.

12. Illustrate the different types of combined assignment and bitwise operators in C program with examples.

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