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Department of Computer Science and Engineering
End Term Examination, March 2022

Course: B.Tech, 1st Semester **Section - A/B/C/D/E**
Subject Name-Computer Programming and Problem Solving **Subject Code- CSE-104**
Date: 15-03-2022 **Max. Marks: 50**
Time: 9:30 AM to 12:30 PM **Submission/uploading time: 12:30 to 01:00 PM (30 Minutes)**

Note:
1. All questions are compulsory.
2. Take suitable assumptions wherever necessary and clearly state the same.
3. Don't wait till the deadline to upload, do it as soon as you finish your paper.
4. Submit/upload the answer sheet in single pdf file with filename as your roll number, for example (21A001.pdf)

Q. No.	Question	M
Q1	a) Create a structure called **library** to hold accession number, title of the book, author name, price of the book, and flag indicating whether book is issued or not. Write a **menu-driven** program that implements the working of a library. The menu options should be: i. Add book information ii. Display book information iii. List all books of a given author iv. List the title of specified book v. List the count of books in the library vi. List the books in the order of accession number vii. Exit	7+3 =10
	b) Write a C program for the following pattern using any loop $000$000$ 0$00$00$0 00$0$0$00 000$$$000	

Q2	a) How many time ***f (a, 6)*** will be the called for the following C program and return the final output value? Construct the tree of each step clearly.
	`#include<stdio.h>`
	`int f(int* a, int n)`
	`{`
	`  if (n <= 0) return 0;`
	`  else if (*a % 2 == 0) return *a + f(a + 1, n - 1);`
	`  else return *a - f(a + 1, n - 1);`
	`}`
	`int main()`
	`{`
	`  int a[] = { 12, 7, 13, 4, 11, 6 };`
	`  printf("%d", f(a, 6));`
	`  return 0;`
	`}`
		5+5 =10

	b) You are supposed to enter the inputs as "*your first name*" and "*your last name*". Now after receiving the inputs, transform your entered first name and your entered last name into the binary strings, in such a way	

	that the vowels are represented with 1's and consonants are represented with 0's. Example: User entered first name: "*abc*", last name: "*mno*" -write "*100*", "*001*" respectively. Write a program to perform bitwise AND, OR and XOR on these two binaries. NOTE: Represent binary strings in 16 bits. You may prefix the strings with 0's to make your operations compatible.	
Q3	a) Write a C program to enter your Scholar No. in an array starting from 0th index. Firstly, separate the numbers in even and odd indices. Then, add the digits in these indices. Lastly, multiply the separate sum computed. For example, if your scholar no. is S[i]: 2 | 0 | 3 | 1 | 1 | 2 | 5 | 0 | 1 Find out the elements for even and odd indices say E[i] and O[i]. Calculate the summation of all the elements in E[i] and O[i] separately. Then, find the product of these two summations.	6+4 =10

	b) Write the if-else-if equivalent code for the following code snippet. Also show output of your program by taking input as (last_3digit_roll_no %10).
	
	`#include <stdio.h>`
	`main()`
	`{`
	`int number;`
	`scanf("%d",&number);`
	`switch(number)`
	`{`
	`case 2: { printf("two"); }`
	`case 12: { printf("twelve");break; }`
	`case 22: { printf("twenty two"); }`
	`case 1: { printf("one"); }`
	`default : { printf("Nothing"); }`
	`}`
	`}`	

Q4	a) Write a C program for the square matrix pattern, where each N^{th} row contains the same N value. Add corner elements and check whether the sum is equal to 10 or not.	5+5 =10
	b) Write a program to find the frequency of characters in a string without using == operator. Sample output: Enter a string - awesome Enter a character to find its frequency - e Frequency of e - 2	
Q5	a) Consider the below snippet of code. Enter your FirstNameXLastNameX as input to the program character by character in sequence. For example, if your name is AMIT ROY then enter as below A M I T X R O Y X Answer the following with respect to your own first and last name (ignore middle name if any). (i) How many times is the function myFunc1() called before termination of the program? (ii) What is your final output? Zero (0) marks will be awarded in case you enter someone else's firstname and lastname as input and show final output.	6+4 =10

```c
#include<stdio.h>
void myFunc1() {
  char c1;
  scanf(" %c",&c1);
  if (c1 != 'X')
     myFunc1();
  printf("%c", c1);
  return;
}
int main() {
    myFunc1();
    myFunc1();
    return 0;
}
```

b) Write a program to replace all EVEN elements by 0 and Odd by 1 in One Dimensional Array without using % and == operators. You can use any other operators. You can assume an initialised array of size 10.

----------End----------