**Department of Computer Science and Engineering**

**B.Tech CSE 2017 Batch**

**Semester: 2**

**Vacation Assignment for Programming Using C**

1. Develop and write a C program using structure to represent an employee record containing employee id, name, salary and department name for an employee. Use this structure to store and print the values for the same. Implement a function to raise the salary for an employee by 10%.
2. Develop and write a C program to check whether the given (n\*n) matrix is upper triangular matrix or lower triangular matrix. (Note: A matrix is called upper triangular matrix is the elements below the diagonal elements are equal to zero). Use only the pointer variables to access the elements of the matrix.
3. Develop and write a C[Program to Find the Number of Vowels, Consonants, Digits and White space in a String](http://www.programiz.com/c-programming/examples/vowel-consonant-frequency-string)
4. Develop and write a function *power( )*to raise a number *m* to a power *n*. The function takes a double value for *m* and integer value for *n*, and returns the result correctly. Use a default value of 2 for *n* to make the function to calculate squares when this argument is send as 0. Write a main that gets the values of *m* and *n* from the user to test the function.
5. Develop and write a [C program to Reverse a Sentence Using Recursion](http://www.programiz.com/c-programming/examples/reverse-sentence-recursion).
6. Develop and write a C program to add two complex numbers by passing structure to a function.
7. Develop and write a C program for inserting an element into an array at a specific position using a function that receives array, size of array, new element and position of new element to be inserted.
8. Develop and write a C program to define a structure called box to store the length, breadth, height and volume details of a rectangular box and accomplish the following using functions.
9. Read *n* such box information.
10. Calculate volume and update each structure.
11. Sort all the boxes based on volume.

Display details of boxes before and after sorting.

1. Develop and writea C program to take three integer number from user which are stored in the variables a, b and c respectively. Pass these variables to a function using call by reference. The function has to swap the values of these elements in cyclic order.

**Sample output:**

Enter value of a, b and c respectively: 1 2 3

Value before swapping: a=1 b=2 c=3

Value after swapping numbers in cycle: a=3 b=1 c=2

1. Develop and write a C program to accept a coordinate point in a *XY* coordinate system and determine in which quadrant the coordinate point lies.
2. Develop and writea C Program to compute sum of the array elements using pointers
3. Develop and writea C program to define a structure to store a vector (a series of integer values) of size *k*. Create *n* such vectors, and perform the following tasks.
4. Input data of all vectors.
5. Modify the value of *jth* element of *ith* vector. (*i*&*j* are user input)
6. Multiply a specified vector by a scalar value.
7. Display all vectors.
8. Develop and writea C program that reads a number, and perform the following tasks using functions.
9. Populate an array with the factors of the number read.
10. Display the items of populated array.

(Use *call by reference*method wherever necessary)

1. Develop and writea C program to read a matrix of order *m*x *n*, and find the sum of all of its rows using pointer to array notation.
2. Develop and writea C program to define a structure called *book* having fields *accno*, *title*, *price*, *month\_year\_publication* (month, year is a nested structure), and perform the following tasks using functions.
3. Read *n* books’ data
4. Search for a book and return a pointer to searched book. Display searched item details in the *main* function.
5. Display all books published in the current year.
6. Develop and writea C program to compute *LCM* and *GCD* of two non-zero, non-negative integers using the prototype *void lcm\_gcd(int, int, int\*, int\*).*
7. Develop and writea C program for a medical shop to list all drugs expired. Use the following constructs in your program
8. A structure *drugs(drug\_code, drug\_name, exp\_date, count)*
9. A function to read *n* drugs’ stock information and current date.
10. A function having prototype *intexp\_drugs(drugs stock[ ],drugs expd[ ],int n)* and returns the number of drugs expired.
11. Develop and writea C program to read an *m x n* matrix, display its transpose, and also multiply the transpose with the original matrix.
12. Develop and writea C program to perform the following tasks in an integer array of size *n*
13. To find the frequency of each element in the array.
14. To print the duplicate elements.
15. To print the unique elements.
16. Develop and writea C program to perform the following tasks in a string of length*n*
17. To find the length of the string without using the function.
18. To list the characters one by one.
19. To count total number of words.
20. To count maximum occurring character.
21. Develop and Write a program in C to find the sum of the series 1!/1+2!/2+3!/3+4!/4+5!/5 using the function
22. Develop and Write a program in C to convert decimal number to binary number using the function.
23. Develop and Write a program in C to print all perfect numbers in given range using the function.
24. Develop and Write a program in C to find the sum of digits of a number using recursion

[P.T.O]

1. Develop a C program to implement simple customer billing system. Store the customer records in array of structure. Each record is to contain ***customer’s name, street, city, state, account number, account type, previous balance, current balance, new balance*** and ***payment date***.

The overall strategy of the program is as follows

1. Specify the number of customers to be processed.
2. For each customer get only the following information using a function

***Name, street, city, account number, previous balance, current payment*** and ***payment date.***

1. After getting inputs, pass each customer record to a function to update, as follows
   1. Compare the current payment (*CP*) with previous balance (*pb*)
      1. If *CP* is greater than 0 and less than 10 percent of *pb* then update the account type as ‘overdue’
      2. If there is a previous balance and current payment is 0 update the account type as ‘delinquent’
      3. Otherwise the account type is ‘current’
   2. Calculate the new balance by subtracting current payment from previous balance.
2. After updating information of all the customers. Print the following information of the customer using a function.

***customer’s name, street, city, state, account number, account type, previous balance, current balance, new balance*** and ***payment date***

1. Use a function for reading and update and another for display.