Function and Pointers

(Any ten assignments)

1. Write a function to compute the distance between two points and use it to develop another function that will compute the area of the triangle whose vertices are A(x1, y1), B(x2, y2), and C(x3, y3). Use these functions to develop a function which returns a value 1 if the point (x, y) lies inside the triangle ABC, otherwise a value 0.

2. A positive integer is entered through the keyboard, write a C function to find the binary equivalent of this number using recursion.

3. Write a recursive function which returns the sum of individual digits of a number passed as argument.

4. Amicable numbers are a pair of numbers with the following property: the sum of all of the proper divisors of the first number (not including itself) exactly equals the second number while the sum of all of the proper divisors of the second number (not including itself) likewise equals the first number. Write a function which takes as argument two numbers and returns 1 if they are amicable numbers else 0. **[OPTIONAL]**

5. Write a C program which accepts a string from user and counts the number of characters in the string without using string library functions.

6. Write a C program which accepts a string from user and prints the reverse of the string without using string library functions.

7. Write a C program which accepts a full name from user prints the initials. Eg. SRT for Sachin Ramesh Tendulkar.

8. Write a C program which accepts any string of the form “Ustad Bade Ghulam Ali Khan was the Tansen of the 20th century” and prints it as “Ustad|Bade|Ghulam|Ali| Khan|was|the|Tansen|of|the|20th|century”. **[OPTIONAL]**

9. Write a program that reads a line and converts it into all capitals without using any string library function. (input string may also contain capital letters)

10. Write a program to count the number of occurrences of any two vowels in succession in a line of text.

11. Write a program that reads a line and delete from it all occurrences of the word “the”. Do not use any string library function. **[OPTIONAL]**

12. Write a program that converts a string like “123” to integer 123. Do not use any string library function.

13. Write a C program which accepts a string from user and checks whether it is palindrome or not. Do not use any string library function. [Example of a palindrome string: "abcba", "abba"]

14. Write a C program which accepts a string from user and counts the number of words in it. Do not use any string library function.

15. Write a C program which accepts a multi-word string in which successive words may be separated by multiple blanks and reformats the string such that successive words are separated by single blank only. Do not use any string library function. **[OPTIONAL]**

16. Write a C program which accepts an integer and creates a string representation of the integer value. Do not use any string library function. [Example: If the argument is integer 1234 the program should form the string "1234"]

17. Write a C program which accepts name of five students and marks obtained by them in five subjects and prints the name of the students and the total marks obtained by them in order of merit. **[OPTIONAL]**

18. Write a recursive C function which returns the length of a string passed as an argument. **[OPTIONAL]**

19. Write a C function which takes as argument two dates in dd/mm/yyyy format as strings, compares them and returns 0 if the two dates are same, 1 if the first date is later than the second one and -1 if the first date is earlier than the second date. **[OPTIONAL]**

20. Write a C program that accepts a date as a string in "dd/mm/yyyy" format from the user, and prints the date in "date-month-year" format. [Example: If the input date is "19/04/2010", the program should print 19-April-2010]. **[OPTIONAL]**

21. Write a program in C that will implement the following functions

    a. Count the total number of words in a string.

    b. Find number of occurrences of a given word

    c. Print individual characters of string in reverse order.

    d. Count total number of vowels and consonants in a string.

    e. Find the most frequent character in a string.

    f. Check whether a given substring is present in the given string. **[OPTIONAL]**

22. Write a program in C to read some strings through keyboard and sort it using bubble sort. **[OPTIONAL]**

23. Write a program in C to store n numbers in an array and print the elements using pointers. Also compute the sum of all elements of that array using pointers.

24. Write a C function which accepts a string str1 and returns a new string str2 which is str1 with each word reversed. Do not use any string library function.

25. Write a C function which takes as argument two strings str1 and str2. It creates a third string str3 which is formed by taking alternating characters from each string and returns it. Example: If the two string arguments are “abcd” and “efgh” the function should return the string “aebfcgdh”, If the two string arguments are “abcd” and “efghijkl” the function should return the string “aebfcgdhijkl”. Do not use any string library function. **[OPTIONAL]**

26. Write a C function which takes as argument two strings str1 and str2 and an integer i. It returns a new string which is obtained by appending str2 from the ith character in str1. Example: If the two string arguments are “abcd” and “pqrs” and i is 2, then the function should return the string “abpqrs”. Do not use any string library function. **[OPTIONAL]**

27. Write a function squeeze(s,c) which removes all occurrences of the character c from the string s.

28. Write the function strend(s,t), which returns 1 if the string t occurs at the end of the string s, and zero otherwise.

29. Write a C function convert(int n, char *s, int w) that accepts three arguments. The function stores the string representation of n in s. The third argument w is a minimum field width; the converted number must be padded with blanks on the left if necessary to make it wide enough. **[OPTIONAL]**

30. Write a C program which dynamically allocates memory for two matrices, orders of which is given by the user, and reads the values of elements of the matrices from the user. The program creates a third matrix which is obtained by multiplying the two input matrices. Your program should check for conformity of multiplication of the two matrices given by the user.

31. Write a program named SUM2L to find out the sum of the last two numbers provided as command line arguments.