



SIDDAGANGA INSTITUTE OF TECHNOLOGY, TUMKUR-572103
 DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
 FOUNDATIONS OF COMPUTER PROGRAMMING LABORATORY

2017-18

Lab Hours/ Week	: 4.0	Credits :	2. 0
Sub. Code	: FCPL	CIE Marks :	50
		SEE Marks :	50

Instruction:

- **Part A carries 15 marks and Part B carries 25 marks in the SEE.**
- **Viva-Voce 10 Marks**

PART-A	
1	Write a program to calculate the total sales of a shop, given the unit price, quantity, discount rate and sales tax rate of a particular product. The sales tax is 8.5% which should be specified using a defined constant. The output should be displayed in proper form using appropriate format specifiers.
2	Write a program to extract and add the two least significant digits of an integer using the following user defined functions. <ul style="list-style-type: none"> i. Function that obtains the unit place digit of a given number ii. Function that obtains the tenth place digit of a given number iii. Function that adds unit and tenth place digits of a given number The main function should call these functions.
3	Write a program using switch statement, to find all the possible roots of Quadratic equation. Display suitable error messages for invalid inputs. Write a user defined function fnCalcDiscriminant to calculate the discriminant.
4	Write a C program to read the marks of quiz1, quiz2, quiz3, quiz4, test1, test 2 and final exam of a student in one course. Maximum marks for each exam is given in the table 1 below. Calculate the total of all the marks and print the appropriate grade to the student as given in the table 2.

Type of exam	Total marks	Reduced To
Quiz 1	15	3
Quiz 2	15	6
Quiz 3	15	
Quiz 4	15	3
Test 1	50	17
Test 2	50	17
Assignment		4
Internal CIE		50
Final Exam	100	50
Total Marks	100 (Final Exam + Internal CIE)	

Total marks	Grades
90 AND ABOVE	S
FROM 75 TO 89	A
FROM 61 TO 74	B
FROM 50 TO 60	C
FROM 40 TO 49	D
LESS THAN 40	F

	User must use Ceil () function to round up the value. Program calculates the internal CIE of student.
5	Write a program to find Sine of an angle using the series. $\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots$. For given N terms using the for loop structure. Also print Sin(x) using Library Function.
6	Write a program to display the calendar of a month whose starting day of the week and number of days in the month are given as input. (0,1,2,3...6 represent Sunday, Monday.....Saturday respectively). Write a function printMonth which takes these values as parameters and prints the calendar of the month. Perform input validation as well
7	Write a Program to calculate the area under the curve $y = \log(x)$ within a given left and right limit. Use trapezoidal approximation. Write a user defined function fnTrapArea to calculate the area of a trapezoid.
8	Write a recursive C function to find the factorial of a number, $n!$, defined by $\text{fact}(n)=1$, if $n=0$. Otherwise $\text{fact}(n)=n*\text{fact}(n-1)$. Using this function, Write a program to compute the binomial coefficient nCr . Perform input validation as well.
9	Write a C to find the value of 'x' raised to the power 'n' using recursion.
10	Write a program that reads the length, breadth and height of a cuboid. The program has to calculate the surface area and volume of the cuboid using the function fnCalcVolSurfArea. The results are then to be displayed by the main function. (Hint: use pass by reference)
	PART-B
1	Write a program to find the Difference of two sets(sets have distinct elements) $A - B = \{ X / X \text{ belongs to } A \text{ and } X \text{ does not belongs to } B \}$.
2	Write a program that reads N integer numbers and arrange them in ascending order using Bubble Sort technique. Write user defined functions for the following i) Function to generate n random numbers in the range 0 to 999 and store it in an array. ii) Sorts N integer numbers in ascending order using bubble sort iii) Display N integers.
3	Write a program that reads N integer numbers in sorted order and perform a search operation on input by accepting a key element from the user applying Binary Search method. Report the result SUCCESS or FAILURE as the case may be. Write user defined functions for the following i) Reads N integer numbers ii) Display N integers iii) Search for a key element using Binary Search
4	Write a program to find the smallest and largest elements in an array using pointers and then swap these elements and display the resultant array.
5	Write a program that reads a matrix of order M X N. Write user defined functions for the following. i) Reads M X N Matrix. ii) Display the Matrix. iii) To check whether given matrix is Identity or Not Identity Matrix. The main function should call these functions.

6	Write a program that reads two matrices A (m x n) and B (p x q) and Compute the product A X B. Read matrix A in row major order and matrix B in column major order. Print both the input matrices and resultant matrix with suitable headings and in matrix format. Program must check the compatibility of orders of the matrices for multiplication. Report appropriate message in case of incompatibility.
7	Write a Program to implement Caesar Cipher. Input a message and then encodes it by replacing each character in the message by a character that is three positions ahead in the English alphabet sequence, wrap back to 'a' if the character is 'z'. Display the encoded message. Decode the message using the inverse procedure and display it.
8	Write a program to read a line of text from the keyboard and print the number of occurrences of a given substring using the built-in function strstr().
9	Write a program in C that stores the details of N number of students given by the user. The following are the information stored for each student i)Name ii)USN iii)Marks scored in 3 subjects Then find and display details of i)Average marks of each student ii) Topper of the batch
10	Write a program that reads an unsigned integer and then perform the following operations using user defined functions. i) Check given input is even or odd. ii) To perform the swapping of two numbers. (Both Program should use Bitwise Operators only)