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Paper Code: TCS201

End Semester Examination 2019

IIInd Semester

Programming for Problem solving

Time: Three Hours

MM: 100

**Note:**

- (i) All questions are compulsory.
- (ii) Answer any two sub questions among a, b & c in each main question

- Que1: a) What is recursion? Explain with an example and step by step stack representation.  
b) Draw a flowchart to pass an array of n integer numbers to a function and count number of positive, negative and zeros.  
c) Write a menu driven C program to implement following functions based upon the given inputs.
1. Addition of two integers
  2. Square of an integer number
  3. Largest of two integer's number
  4. Exit

- Que2: a) Differentiate between string and character array. Explain 5 pre define function of string handling function with suitable syntax and example.  
b) Draw a flowchart to input a string and arrange that in alphabetical order.  
Sample Input: thankyou  
Sample Output: ahknotuy  
c) Write a C program to input two strings using dynamic memory allocation and concatenate these two strings.

- Que3: a) Write short notes on following:
- 1) Self referential structure
  - 2) bit-field
- b) Write an algorithm to input an array using pointer and replace all the numbers by their cube.  
c) Create a structure Train\_info with the data members tarin\_no (int type), train\_name(char type), departure\_station(char type), arrival\_station(char type), departure\_time(int type), arrival\_time(int type). Time should having two fields for hour and minute. Write a C program to input details of n trains and display details of the trains which are travelling between any two stations inputted by user.

- Que4: a) What is the need of file? Explain various functions of file handling by which we can achieve random accessing of file.  
b) Write an algorithm to input a paragraph in a file and print all three letters words on the screen.  
c) Write a C program to write n integer numbers into a file named INDATA. Then read the numbers from the file and write factorial of each number into another file named OUTDATA.

- Que5: a) What is the difference between list and tuples? Explain with an example.  
b) Write a python program that take a numbers as input from user and print sum of digit of that number.  
c) Write a python program that create a list for all the numbers in a given limit and indicate weather number is perfect or not.