



Structured Programming Approach - May 17

First Year Engineering (Semester 2)

Total marks: 80

Total time: 3 Hours

INSTRUCTIONS

- (1) Question 1 is compulsory.**
- (2) Attempt *any three* from the remaining questions.**
- (3) Draw neat diagrams wherever necessary.**

- 1.a. Convert **0010 0100 0010 1101** from base 2 to decimal. Convert 134 from base 10 to hexadecimal. Write steps of conversion. **(4 marks)**
- 1.b. Enlist all the data types in C language along with their memory requirements, format specifiers and range. **(4 marks)**
- 1.c. Draw flowchart for 'if else' and 'while' statements of C language. **(4 marks)**
- 1.d. What is use of storage classes? Explain external storage classes with suitable example. **(5 marks)**
- 1.e. Differentiate between structure and union. **(4 marks)**

- 2.a. What is need of computer programming? What do you mean by structured programming? Develop an ALGORITHM and FLOWCHART to find reverse of a number. **(10 marks)**
- 2.b. Write a menu driven program to perform arithmetic operations on two integers. The menu should be repeated until the user selects 'STOP' option. Program should have independent user defined function for each case **(10 marks)**

- 3.a. Write a program that creates two integer arrays of size 8 and 7. Initialize the arrays with random values. Sort the arrays in ascending order with the help of a user defined function namely 'sortArray'. Merge these arrays with the help of another user defined function named 'mergeArrays' which returns a new array. Program should display the arrays before and after sorting, also the merged array. **(10 marks)**
- 3.b. What are advantages and disadvantages of recursion? Comment on conditions to be considered while writing a recursive function. Write a program to print Fibonacci series up to N terms using a recursive function. **(10 marks)**

- 4.a. What are structures? Comment on nested structures. Write a program to read Title, Author and Price of 10 books using array of structures. Display the records in ascending order of Price. **(10 marks)**
- 4.b.i. Explain gets() and puts() functions of C language. Comment on their parameters and return values.



(5 marks)

4.b.ii. Enlist bitwise operators in C language. Explain any 2 with examples.

(5 marks)

5.a. Write programs to print following patterns for N lines

```
1
2 3 2
3 4 5 4 3
4 5 6 7 6 5 4
5 6 7 8 9 8 7 6 5
```

(5 marks)

5.b. Why files are needed? Explain all the file opening modes. Write a program to create copy of a file. Let the user specify names of source and destination files.

(10 marks)

6.a. Comment on dynamic memory allocation. Write a program to read and store N integers in an array, where value of N is defined by user. Find minimum and maximum numbers from the array. **(8 marks)**

6.b. Explain any 4 functions from string.h header file with suitable examples. **(8 marks)**

6.c. Explain continue and break statements with the help of suitable examples. **(4 marks)**