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14PCD13/23

**First/Second Semester B.E. Degree Examination, June/July 2015**
**Programming in C and Data Structures**

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE questions, selecting ONE full question from each part.

**PART-1**

- 1 a. What are data types? Mention the different data types supported by C language, giving an example to each. (05 Marks)
- b. Write a C program which takes as input p, t, r, compute the simple interest and display the result. (05 Marks)
- c. What is an operator? List and explain various types of operators. (05 Marks)

- 2 a. What is a token? What are different types of tokens available in C language? Explain. (08 Marks)

- b. Write C expressions corresponding to the following (Assume all quantities are of same type)

- i)  $A = \frac{5x+3y}{a+b}$       ii)  $B = \sqrt{s(s-90)(s-13)(s-c)}$       iii)  $C = \frac{e^{10} + Y^{-10}}{2a}$
- iv)  $D = x^{25} + y^{35}$       v)  $X = \frac{a^2 + b^2}{c^2}$       vi)  $X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$  (06 Marks)

What is the value of 'x' in the following code segments? Justify your answers :

- i) `int a, b; float x; a = 4; b = 5; x = b/a;`      ii) `float x; a = 4; b = 5; x = (float) b/a;` (06 Marks)

**PART-2**

- 3 a. What are different types of conditional decision making statements? Explain each with examples. (10 Marks)

- b. Write a C program to simulate simple calculator that performs arithmetic operations using switch statement. Error message should be displayed, if any attempt is made to divide by zero. (10 Marks)

- 4 a. Explain with examples formatted input output statements in C. (06 Marks)

- b. List four differences between while loop and do-while loop along with syntax and example. (06 Marks)

- c. Design and develop a C program to reverse a given four digit integer number and check whether it is a palindrome or not. (08 Marks)

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### PART-3

- 5 a. What is an array? Explain different methods of initialization of single dimensional arrays. (06 Marks)
- b. Write a C program to read N integers into an array A and to
- find the sum of odd numbers
  - find the sum of even numbers
  - find the average of all numbers
- Output the results computed with appropriate headings. (06 Marks)
- c. How string is declared and initialized? Explain any FOUR string manipulation with examples. (08 Marks)
- 6 a. Explain function call, function definition and function prototype with examples to each. (06 Marks)
- b. What are actual parameters and formal parameters? Illustrate with example. (06 Marks)
- c. What is recursion? Write a C program to compute the factors of a given number 'n' using recursion. (08 Marks)

### PART-4

- 7 a. How structure is different from an array? Explain declaration of a structure with an example. (06 Marks)
- b. Explain with an example, how to create structure using 'typedef'. (04 Marks)
- c. Write a C program to input the details of 'N' students using structure :  
Roll No : integer, Name : char[40], Marks : float, Grade : char  
Print the names of the students with marks 70.0%. (10 Marks)
- Explain following functions along with syntax and examples :  
i) fopen() ii) fgetc() iii) fscanf() iv) fprintf() v) fgets(). (10 Marks)
- Write a C program to read the contents from the file called abc.txt, count the number of characters, number of lines and number of white spaces and output the same. (10 Marks)

### PART-5

- 9 a. , point point variable. Explain with an example, the declaration and initialization of pointer (06 Marks)
- b. Explain following C functions along with syntax and example to each :  
i) malloc() ii) calloc() iii) realloc() iv) free(). (08 Marks)
- c. Develop a C program to read two numbers and function to swap these numbers using pointers. (06 Marks)
- 10 Write short notes on following :
- Preprocessor directives
  - Primitive and non primitive data types
  - Stack operations
  - Types of queues.
- (20 Marks)