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**First Semester B.E. Degree Examination, Dec.2014/Jan.2015**  
**Programming in 'C' and Data Structures**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting atleast ONE questions from each part.**

**PART – 1**

- 1 a. What is pseudocode? Explain with an example. (04 Marks)  
b. Explain the structure of C program with an example. (06 Marks)  
c. Explain any five operators used in C language. (10 Marks)
- 2 a. What is type conversion? Explain two types of type conversions with examples. (06 Marks)  
b. Write a program in C to find the area and perimeter of a rectangle. (06 Marks)  
c. Define : i) Variable ii) Constant iii) Associativity iv) Precedence. (08 Marks)

**PART – 2**

- 3 a. What is two way selection statement? Explain if, if-else, nested if-else and cascaded if-else with examples and syntax. (10 Marks)  
b. Write a program that takes three coefficients (a, b, and c) of a quadratic equation :  $(ax^2 + bx + c)$  as input and compute all possible roots and print them with appropriate messages. (10 Marks)
- 4 a. Explain switch statement with an example. (06 Marks)  
b. What is a loop? Explain the different loops in C language. (10 Marks)  
c. Show how break and continue statements are used in a C program, with example. (04 Marks)

**PART – 3**

- 5 a. What is an array? How is a single dimension array is declared and initialized? (06 Marks)  
b. Write a C program to evaluate the polynomial  $f(x) = a_4x^4 + a_3x^3 + a_2x^2 + a_1x + a_0$ , for a given value of x and its coefficients using Horner's method. (06 Marks)  
c. Explain string manipulation functions, with examples. (08 Marks)
- 6 a. What is a function? Write a function to find the sum of two numbers. (06 Marks)  
b. Explain the two categories of argument passing techniques, with examples. (06 Marks)  
c. Write a C function isprime(num) that accepts an integer argument and returns 1 if the argument is a prime or a 0 otherwise. Write a program that invokes this function to generate prime numbers between the given ranges. (08 Marks)

**PART – 4**

- 7 a. What is structure data type? Explain. (04 Marks)  
b. Show how a structure variable is passed as a parameter to a function, with an example (06 Marks)  
c. Explain the concept of array of structures, with a suitable C program. (10 Marks)
- 8 a. What is a file? Explain fopen( ), fclose( ) functions. (04 Marks)  
b. Explain how the input is accepted from a file and displayed. (06 Marks)  
c. Given two text documentary files "Ramayana.in" and "Mahabharatha.in". Write a C program to create a new file "Karnataka.in" that appends the content of the file "Ramayana.in" to the file "Mahabharatha.in". Also calculate the number of words and new lines in the output file. (10 Marks)



## PART – 5

- 9 a. What is a pointer? Write a program in C to find the sum and mean of all elements in an array. Use pointer technology. (08 Marks)
- b. What is preprocessor directive? Explain #define and #include preprocessor directives. (08 Marks)
- c. Explain : (04 Marks)
- i) Dynamic memory allocation
  - ii) Malloc function.
- 10 a. What are primitive and non primitive datatypes? Explain. (06 Marks)
- b. Define queue. Explain it along with its application. (08 Marks)
- c. Explain : (06 Marks)
- i) Abstract data type
  - ii) Stack
  - iii) Linked list.

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