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13MCA11

First Semester MCA Degree Examination, Dec.2015/Jan.2016
Problem Solving Using C

Time: 3 hrs.

Max. Marks:100

Note: *Answer any FIVE full questions.*

1   a. The variable x, y, are int and a, b are float. Find result computed into these variables from the following expressions : **(06 Marks)**
    i)   x = 1560 / 100 + 3.8   ;   ii) y = 1560 / 100.0 + 3.8   ;
    iii) a = 1560 / 100 + 3.8   ;   iv) b = 1560 / 100.0 + 3.8   ;
    v)   x = 8/3 * 2 + 5%6 * 2 – 1/2 * 2   ;   vi) x = 025/3 + 0 × 10.

  b. Write equivalent 'C' expressions for the following :

    i) $0 < x < 1$ ii) $\dfrac{\sin 45^0 + \cos 60^0}{xy}$

    iii) $\sqrt[n]{x} + \log_{10} x + e^x$ iv) $\dfrac{\sin^{-1} x + \tan \theta}{\alpha + \beta}$.   **(04 Marks)**

  c. What is a Flow Chart? Draw flowchart to find biggest of three numbers.   **(04 Marks)**
  d. What are the Storage classes available in 'C' programming language?   **(06 Marks)**

2   a. Write the structure of a typical 'C' program and explain the significance of each section. **(10 Marks)**

  b. Explain the similarities and dissimilarity between switch and if....else ladder.   **(10 Marks)**

3   a. What are the user defined datatypes? Explain each with example.   **(06 Marks)**
  b. What is a Nested loop? Write a program to print multiplication table from 1 to 10 using the nested loop.   **(06 Marks)**
  c. Explain the following :   **(08 Marks)**
      i) getchar( )   ii) gets ( )   iii) putchar ( )   iv) puts ( ).

4   a. Write a program to get column sums in a matrix of size m × n.   **(05 Marks)**
  b. Explain any three built in string functions.   **(05 Marks)**
  c. What are Arrays? Explain the different ways of declaration and initialization of arrays.   **(10 Marks)**

5   a. What is a Function? What is the need for user defined function?   **(04 Marks)**
  b. What is a Recursive function? Write a recursive function to find natural sum of a given number. $\Sigma n = 1 + 2 + 3 + 4 + ...+ n.$ **(08 Marks)**
  c. Explain the following :   **(06 Marks)**
      i) Call by value   ii) Call by reference.
  d. If x and y are integer variables and p and q are pointers to integer, which of the following are valid and invalid expressions?
      i) p = &x ;   ii)   y = & p   ;   iii) q = * x ;   iv)   * p = * q.   **(02 Marks)**

6 a. Write a program that needs an array of structures named "Book". The structure has three
      fields - name of the book.   **(12 Marks)**
                  - price
                  - number of pages.
      Perform a linear search based on a particular book name and print the details of the book.
   b. What is Union in 'C' programming language? How it is difficult from structure? Give an
      example for a union.   **(08 Marks)**

7 a. What are Bit fields? What is their significance?   **(04 Marks)**
   b. Write a program to demonstrate command line argument.   **(04 Marks)**
   c. Write a program to receive a string from keyboard and writes them to file.   **(06 Marks)**
   d. What are the functions available in 'C' to access the file randomly?   **(06 Marks)**

8 a. Explain the syntax and working of the following functions :
      i) malloc ( )   ii) calloc ( )   iii) reaclloc ( )   iv) free ( ).   **(10 Marks)**
   b. What are Preprocessor directives? Mention and explain the categories of directives with
      suitable example.   **(10 Marks)**

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