USN [| | | | | | | |]   **13MCA11**

First Semester MCA Degree Examination, Dec. 2013/Jan. 2014
Problem Solving using C

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. What is an algorithm? Give and explain the characteristics of an algorithm. Write an algorithm to find the average of 'n' numbers.   **(10 Marks)**
   b. Find the errors and rectify them.
      1. long int m ; count ;
      2. s = /5;
      3. m, n, o : INTEGER
      4. x = y = z = 0.5, 2.0, –5.75;
      5. double = p, q;
      6. char char;
      7. x = ++a ++ b;
      8. float x; x = 5/6 ;
      9. long float temp ;
      10. exponent a, b ;   **(10 Marks)**

2 a. Assuming x = 100, state whether the following logical expressions are true or false.
      i)   x = = 100 && x > 100 && ! x
      ii) x = = 100 || x > 100 && ! x
      iii) x = = 100 && x > 100 || ! x
      iv) x = = 100 || x > 100 || ! x
      v)   x = = 100 || ! X && x > 100.   **(05 Marks)**
   b. Assuming that x = 10, y = 0 and z = 5 for every code segment, what will be their values after each code segments ?
      i) if (x && y) x = 100 ;
          else y = 100 ;
      ii) if (x || y || z) y =100 ;
          else z = 100 ;
      iii) if (x)
             if (y)
               z = 100 ;
           else
             z = 0 ;
      iv) if ((x = = 0) || (x &&y))
           if (!y)
             z = 0 ;
           else y = 5 ;
      v) if ((x > y) || (!y))
           if (!z)
           x = 1 ;
           else
           y = 1 ;
           else z = 1 ;   **(05 Marks)**

   c. Explain the different control structures, with examples. Write the flow diagram for the same.
                                                                  (10 Marks)

3 a. What is an array? Explain the syntax of declaring one dimensional and two dimensional array, with examples. **(12 Marks)**

b. Write a C program to input a string and display whether it is palindrome without using library functions. **(08 Marks)**

4 a. Explain the categories of functions, with examples. **(12 Marks)**

b. What is recursion? Write a recursive program to find the GCD of two numbers. **(08 Marks)**

5 a. Write a C program to accept two matrices and display their product using functions for reading, calculating product and displaying. **(10 Marks)**

b. Write a program to read an array of integers using pointers and print the elements in the reverse order. **(10 Marks)**

6 a. Explain the difference between structures and unions, with an example. **(05 Marks)**

b. Given the following declarations :
int x = 10, y = 10 ; int *p1 = &x, *p2 = &y ;   for each statement, what is the value of the following expressions :
i)   (*p1) ++ ;
ii)   − − (*p2) ;
iii) *p1 + (*p2) − − ;
iv) ++ (*p2) − *p1 ;
v)   *p1 ++ ; **(05 Marks)**

c. Create an array of 10 elements where each element is a structure with the following fields – IDNO, NAME, MARKS, AGE. Read data into this array. Find the average marks of these 10 students and display the name of the youngest student. **(10 Marks)**

7 a. Write a program that reads a file containing integers and appends at its end the sum of all integers. **(10 Marks)**

b. What is dynamic memory allocation? Which are the different memory allocation functions? Explain with example. **(10 Marks)**

8   Write short notes on :
a. Compiler control directives
b. Command line arguments
c. Type conversion
d. scanf, printf statements. **(20 Marks)**

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