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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.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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) $x = 025/3 + 0 \times 10$.

b. Write equivalent 'C' expressions for the following : **(04 Marks)**

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

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

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. $\Sigma n = 1 + 2 + 3 + 4 + \ldots\ldots + n$. **(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? **(02 Marks)**
i) $p = \&x$; ii) $y = \& p$; iii) $q = * x$; iv) $* p = * q$.

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6 a. Write a program that needs an array of structures named "Book". The structure has three fields - name of the book.
- price
- number of pages.

Perform a linear search based on a particular book name and print the details of the book. **(12 Marks)**

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) reacIloc ( ) 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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