53 (CS 101) INCP

2014

INTRODUCTION TO COMPUTER PROGRAMING

Paper : CS 101

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Attempt all questions.

1. Convert the following : *(any three)*   3×3

    (a) $(4132)_{10} = (?)_{16}$

    (b) $(3128)_{10} = (?)_{16}$

    (c) $(320)_8 = (?)_{10}$

    (d) $(6253)_8 = (?)_{16}$

2. Write short notes on : *(any three)*   4×3

   (a) EPROM

   (b) EEPROM

   (c) ALU

   (d) I/O devices

   (e) Secondary Storage Device

3. Differentiate between : *(any three)*   4×3

   (a) High Level Language and Low Level Language

   (b) Compiler and Assembler

   (c) ROM and RAM

   (d) Structure and Union

4. Draw flowcharts to : *(any two)*   5×2

   (a) Compute the product of all natural numbers in the range [10, 20]

   (b) Find the minimum of three numbers.

   (c) Find the sum of the series :
   $$1^2 + 2^2 + 3^2 + ... + 20^2$$

5. Write complete *C* programs for the following : *(any three)* 5×3

(a) Compute the transpose of a 4×5 matrix.

(b) Compute the sum of two matrices of size 6×7.

(c) Find the sum of the first 100 natural numbers.

(d) Calculate the length of the hypotenuse when the base and altitude of a right angled triangle are given. $\left[h = \sqrt{b^2 + a^2} \right]$

(e) Create a file named "home.txt" and store the name of your hometown in the file.

6. What is a file ? Write the instructions in *C* for creating a file. 2+4

7. Explain "pass by value" and "pass by reference" mechanism for passing arguments in a function call. Develop a function in *C* that will swap (exchange) the values of two integer variables passed as arguments. Also write the main program. 4+6

Or

What is a pointer ? Explain pointer arithmetic. Write a *C* function to double the value of each element in an integer array. The parameters to the function will be a pointer to the first element of the array and the size of the array.   1+4+5

8. Write complete *C* programs for the following : *(any two)*   8×2

   (a) Print all prime numbers less than 100.

   (b) Print the Fibonacci series till the nth term.

   (c) Compute the factorial of an integer using recursion.

9. Explain the concept of dynamic memory allocation in *C* with the help of an example.   10

Or

Write a *C* program to compute the profit earned by a shop. Use a structure to store and access item_name, item_id, cost_price, selling_price and number_of_items_sold.

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