BACHELOR OF ENGINEERING IN COMPUTER SCIENCE AND ENGINEERING

EXAMINATION, 2019

(1st Year, 1st Semester, Old)

INTRODUCTION TO COMPUTER PROGRAMMING

Time : Three hours   Full Marks : 100

Question *No. 1* is Compulsory

Answer *any five* questions.

All question carry equal Marks of *20*

1. (a) Write a program to find the smallest, the largest, the mean and the standard deviation of a set of numbers without using an array. The length of the set is not given.

    (b) Convert a set of Arabic numbers in the range 1 – 9999 to Roman numerals where 1 = I, 5 = V, 10 = X, 50 = L, 100 = C, 500 = D, 1000 = M, 5000 = N. The length of the set is not given.

2. (a) Write a program to find the prime factors of a number.

    (b) Write a program to find the G.C.D. of two numbers by Euclid's algorithm.

3. Write a program for sorting a set of data by *bubble sort*. The program should be able to take advantage of the fact that data sometimes may come already in order at one end of the array.

4. Write a program to search an item from an array of unordered data. The program need not check the array boundary while traversing through it. This is *linear search with sentinel*.

5. (a) Given the declarations
    int &a = 12; int *b; int *&c = b; int *d[5];
    what are the types of the following expressions?
    a, b, *b, c, *c, d[2], *d, **d, c[-2], c-2, *(c-2) and &c.

    (b) Given the declarations
    char c; const char cc = 'a'; char *pc; const char *pcc;
    char *const cpc = &c; const char *const cpcc = &cc; char *const *pcpc;
    which of the following assignments are legal, which are illegal and why?
    C = cc; cc = c; pcc = &c; pcc = &cc; pc = &c; pc = &cc; pc = pcc;
    pc = cpc; pc = cpcc; cpc = pc; *cpc = *pc; pc = *pcpc; **pcpc = *pc;
    *pc = **pcpc;

[Turn over

6. Write a program to display the histogram (frequency curve) of a set of data for which the smallest and the largest are known. The data need not be put in an array, the histogram though requires one.

7. Explain the following terms with suitable examples – stdin, stdout, stderr, fopen, fclose, ferror, fseek, fread, fwrite, fscanf and fprintf.

8. Write a program that takes a decimal number and prints the binary equivalent and again takes a binary number and prints the decimal equivalent.