COMPUTER SCIENCE

Paper – 2

(Planning Session : One hours)

(Examination Session : Two hours)

Instructions

As it is a practical examination the candidate is expected to do the following:

(i) Write an algorithm for the selected problem

(ii) Write a program in C++/Java. Document your program by using mnemonic names and comments

(iii) Test run the program on the computer using the given test data and get a print out (hard copy) in the format specified in the problem along with the program listing.

Solve any one of the following problem.

Question 1.

A positive natural number, (for example 27) can be represented as follows-

2+3+4+5+6+7
8+9+10
13+14

where every row represents a combination of consecutive natural numbers, which add up to 27.

Write a program which inputs a positive natural number N and prints the possible consecutive number combinations, which when added give N.

Test your program for the following data and some random data.

SAMPLE DATA

INPUT

N=9

OUT PUT

4 5
2 3 4

INPUT

N=15

OUTPUT

1 2 3 4 5
4 5 6
7 8

INPUT

N=21

OUT PUT

1 2 3 4 5 6
6 7 8
10 11

Question 2.

Write a program that inputs the names of people into different arrays, A and B. Array A has N number of names, while Array B has M number of names, with no duplicates in either of them. Merge arrays A and B into a single array C, such that the resulting array is sorted alphabetically.

Display all the three array, A, B and C, sorted alphabetically.
Test your program for the given data and random data.

SAMPLE DATA
INPUT
Enter number of names in Array A, N=2
Enter number of names in Array B, M=3

First array: (A)
Suman
Anil
Second array: (B)
Usha
Sachin
John

OUTPUT
Sorted array: (C)
Anil
John
Sachin
Suman
Usha
Sorted first array: (A)
Anil
Suman
Sorted Second array: (B)
John
Sachin
Usha

Question 3.

A new advanced Operating System, incorporating the latest hi-tech features has been designed by Opera Computer Systems.
The task of generating copy protection codes to prevent software piracy has been entrusted to Security Department.
The Security Department has decided to have codes containing a jumbled combination of alternate uppercase letters of the alphabet starting from A up to K (namely among A, C, E, G, I, K). The code may or may not be in consecutive series of alphabets.
Each code should not exceed 6 characters and there should be no repetition of characters.
If it exceeds 6 characters, display an appropriate error message.
Write a program to input a code and its length. At the first instance of an error display "Invalid!" stating the appropriate reason. In case of no error, display the message "Valid!"
Test your program for the following data and some random data.

SAMPLE DATA
INPUT
N = 4
ABCE
OUTPUT
Invalid! Only alternate letters permitted!

INPUT
N = 4
AcIK
OUTPUT
Invalid! Only upper case letters permitted!

INPUT
N = 4
AAKE
OUTPUT
Invalid! Repetition of characters not permitted!

INPUT
N = 7
OUTPUT
Error! Length of string should not exceed 6 characters!

INPUT
N = 4
AEGIK
OUTPUT
Invalid! String length not the same as specified!

INPUT
N = 3
ACE
OUTPUT
Valid!

INPUT
N = 5
GEAIK
OUTPUT
Valid!