

ANNUAL EXAMINATION: 2020-21

Class - XI (ISC)

Subject - Computer Science Paper 2

Time Allowed : Three Hours

Maximum Marks : 30

(Candidates are allowed an additional 15 minutes for **only** reading the paper.
They must not start writing during this time.)

The total time to be spent on the Planning Session and the examination Session is three hours.

Planning Session : 90 minutes

Examination Session : 90 minutes

Note : Candidates are to be permitted to proceed to the Examination Session only after 90 minutes of the Planning session are over.

This paper consists of **three** problems from which candidates are required to attempt **any one** problem.

Candidates are expected to do the following :

1. Write an algorithm for the selected problem.
(Algorithm should be expressed clearly using any standard scheme such as pseudo code or in steps which are simple enough to be obviously computable.) [3]
2. Write a program in **JAVA** language. The program should follow the algorithm and should be logically and syntactically correct. [5]
3. Document the program using mnemonic names / comments, identifying and clearly describing the choice of data types and meaning of variables. [2]
4. Code / Type the program on the computer and get a print out (Hard Copy). Typically, this should be a program that compiles and runs correctly. [2]
5. Test run the program on the computer using the given sample data and get a print out of the output in the format specified in the problem. [3]

In addition to the above, the practical file of the candidate containing the practical work related to programming assignments done during the year is to be evaluated as follows:

- Programming assignments done throughout the year (by the Teacher) [10]
- Programming assignments done throughout the year (by the Visiting Examiner) [5]

Solve any ONE of the following problems.

Question 1

Given a square matrix list [][] of order 'n'. The maximum value possible for 'n' is 20. for 'n' and the positive integers in the matrix and perform the following tasks:

1. Display the original matrix.
2. Print the row and column position of largest element of the matrix.
3. Print the row and column position of the second largest element of the matrix.
4. Sort the elements of the rows in the ascending order and display the new matrix.

SAMPLE DATA :

INPUT :

n = 3

List[][]

5 1 3

7 4 6

9 8 2

OUTPUT :

5 1 3

7 4 6

9 8 2

The largest element 9 is in row 3 and column 1

The second largest element 8 is in row 3 and column 2

Sorted List

1 3 5

4 6 7

2 8 9

This paper consists of 2 printed pages.

Turn Over

Question 2

A sentence is terminated by either "!" or "?" followed by space. Input a piece of text consisting of sentences. Assume that there will be a maximum of 10 sentences in block letters.

Write a program to :

- Obtain the length of the sentence (measured in words) and the frequency of vowels in each sentence.
- Generate the output as shown below using the given data

Sample data

INPUT :

HELLO! HOW ARE YOU? HOPE EVERYTHING IS FINE. BEST OF LUCK.

OUTPUT

Sentence	No. of vowels	No. of Words
1	2	1
2	5	3
3	8	4
4	3	3

Sentence	No. of words/vowels
1	vwvvv www
2	vvvvvvvvvvvvv wwwwwwww
3	vvvvvvvvvvvvvvvvvvv wwwwwwwwwwww
4	vvvvvvv wwwwwwwwww

Scale used : 1 : 3

Question 3

A positive natural number, (for e.g. 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

OUTPUT

4 5

2 3 4

INPUT

N = 15

OUTPUT

7 8

1 2 3 4 5

4 5 6

INPUT

N = 21

OUTPUT

10 11

1 2 3 4 5 6

6 7 8

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