

HALF YEARLY EXAMINATION : 2019-20

Class - XI

Subject - Computer Science Paper 2

Maximum Marks 30

Time Allowed : Three Hours

(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 compatible.) [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 printout (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 printout of the output in the format specified in the problem. [5]
6. Viva-voce on the selected 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) [5]
- Programming assignments done throughout the year (by the Visiting Examiner) [5]

Solve any ONE of the following problems.

Question 1

An integer N is said to be Reversible Prime, if N and its reverse are primes as well as both the integers consist of 3 on either end or 9 on either end.

A number is said to be prime if it has only two factors 1 and itself.

Accept a positive number N and check whether it is a Reversible prime or not. The number itself and its reverse number should also be displayed. An appropriate error message should be displayed, if the input integer is a single digit.

Test your program with the sample data and some random data.

Example 1 : INPUT : N = 3911
OUTPUT : ORIGINAL NUMBER = 3911
REVERSE NUMBER = 1193
3911 IS A REVERSIBLE PRIME

Example 2 : INPUT : N = 9257
OUTPUT : ORIGINAL NUMBER = 9257
REVERSE NUMBER = 7529
9227 IS A REVERSIBLE PRIME

Example 3 : INPUT : N = 17
OUTPUT : ORIGINAL NUMBER = 17
REVERSE NUMBER = 71
17 IS A REVERSIBLE PRIME

Example 4 : INPUT : N = 8
OUTPUT : INVALID NUMBER

Question 2

In an engineering college a project was allotted on a particular date and the students are given N number of days to complete the project then submit on the date falling on Nth day including the date of allotment.

Design a program to accept a date in the format day(dd), month (mm), year (yyyy) and number of days(N). Output the date falling on Nth day and must be in the specified format given in examples. An appropriate error message should be displayed for each negative input and each wrong date and month number.

Test your program for given data and also random data.

Example 1 : INPUT : DAY : 20
MONTH : 12
YEAR : 2015
N : 15

OUTPUT : PROJECT SUBMISSION DATE = 3/1/2016

Example 2 : INPUT : DAY : 4
MONTH : 13
YEAR : 2018
N : -9

OUTPUT : INVALID INPUT

Question 3

Write a program to accept a sentence which may be terminated by either '!', '?' or '#' only. The words are to be separated by a single blank space and are in UPPER CASE.

Perform the following tasks :

- Check for the validity of the accepted sentence.
 - Convert the non-palindrome words of the sentence into palindrome words by concatenating the word by its reverse (excluding the last character).
e.g. The reverse of the word HELP would be LEH (omitting the last alphabet (P)) and by concatenating both, the new palindrome word is HELPLEH.
- NOTE : The words which end with repeated alphabets, for example ABB would become ABBA and not ABBBA and XAZZZ becomes XAZZZAX.
[Palindrome word : Spells same from either side. Example DAD, MADAM etc.]
- Display the original sentence along with the converted sentence.

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

Example 1 : INPUT : The BIRD IS FLYING.
OUTPUT : THE BIRD IS FLYING.
THEHT BIRDRI B ISI FLYINGNMIYLF.

Example 2 : INPUT : IS THE APP LOOKS FINE?
OUTPUT : IS THE APP LOOKS FINE?
ISI THEHT APPA LOOKSKOOL FINENIF.

Example 3 : INPUT : IS THE WATER LEVEL RISING?
OUTPUT : IS THE WATER LEVEL RISING?
ISI THEHT WATERETAW LEVEL RISINGNISIR.

Example 4 : INPUT : YOU MUST BE CRAZY#
OUTPUT : INVALID INPUT