JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2023

B.Tech - V Semester (BI)

COURSE CODE(CREDITS): 18B11BI511 (03)   MAX. MARKS: 15

COURSE NAME: Design And Analysis of Algorithms

COURSE INSTRUCTOR: Dr. Tiratha Raj Singh   MAX. TIME: 1 Hour

Note: (a)All questions are compulsory. (b)Marks are indicated against each question in square brackets.(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

Q.1. What are 5 algorithmic principles/criteria's? Explain each with its respective role in the process of solving problems.   [2] (CO-1)

Q.2. Write an algorithm to generate a Fibonacci series(n). Compare iterative and recursive versions of this algorithms along with their respective complexities.   [2] (CO-1, 2)

Q.3. Compute the space requirements for an algorithm X where the instance is running in n number of steps (instance characteristic).   [1] (CO-1)

Q.4. Discuss the classification of algorithms with an example of each class.   [2] (CO-1)

Q.5. What are asymptotic notations for algorithms analysis. Discuss each with an example. Which case can be used without any doubt to evaluate the performance of any algorithm? Justify your answer with the solution of solving a problem of your choice.   [3] (CO-2)

Q.6. Calculate the number of steps (operations) to compute the running time ($T(n)$) for the following algorithm in terms on input size n: [2] (CO-1, 2)

Algorithm $arrMax(A, n)$

    $currentMax \leftarrow A[0]$

    for $i \leftarrow 1$ to $n - 1$ do

        if $A[i] > currentMax$ then

        $currentMax \leftarrow A[i]$

    { increment counter i }

    return $currentMax$

Q.7. What is divide and conquer approach? Sort an array A [2, 14, 7, 18, 10, 16, 25, 23] using an approach based upon the principle of divide and conquer. Write pseudo code for the applied approach.   [3] (CO-2)