JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY, NOIDA

* Required

1. Email address *

2. Name *

3. Enrollment No. *

4. Batch *

JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY, NOIDA

TEST-1 EXAMINATION -2020-21

B.TECH. III SEMESTER, ODD SEMESTER

Course Title: Data Structures and Algorithms — **Maximum Marks: 20**
Course Code: 18B11CS211 — **Maximum Time: 01 Hr**

Note:

1. This is a paper and pen examination. Answers have to be written on papers only in your own handwriting. No answer has to be given on the Google Form.
2. On the top of your answer sheet, Write your Name, Enrollment number, Batch, Course Name and Course Code.
3. **Answer should be uploaded collectively at the end of examination in a single PDF file of size less than 10MB.**

Objective Questions

Questions 1-10 is of 1 Mark each.

CO1: Q1) The time complexity of $T(n)= 8T(n/2) +n^3 +1$ is _____

CO1: Q2) The time complexity of replacing every element with nearest greater element on the right of that element in a given array of elements is _____

CO1: Q3) The time complexity of the recurrence $T(n)= 2T(\sqrt{n}) + \log n$ is _____

CO1: Q4) The time complexity of the following code is _____

```
void fun(int n){
        int i, count=0;
        for (i=1;i*i<=n; i++)
        count ++;}
```

CO1: Q5) The time complexity of the following code is _____

```
fun(int n){
        for (int i=0;i<n;i++)
                for (int j=i; j<i*i;j++)
                if (j%i==0){
                        for (int k=0;k<j;k++)
                                printf(" # ");}}
```

CO2: Q6) The number of binary trees possible with 10 nodes is _____

CO2: Q7) The time complexity of reversing the elements of a given stack using only stack operations (push and pop) is_____

CO2: Q8) The postfix expresssion for a * (b ^ c) – d / e – a / (c ^ 2 ^ 5) is _____

CO2: Q9) Average case complexity of Quick sort is _____

CO2: Q10) Average case complexity of Interpolation Search is _____

Subjective Questions

CO1: Q11) [3 Marks] Solve the following recurrence relation by using the recursion tree method only:
$T(n) = T(n/3) + T(2n/3) + n^3$

CO1: Q12) [3 Marks] In a cement factory, **n** identical looking cement bags are stored in **n** stacks. All the bags of a particular stack weigh less than the bags of other stacks having right weight in a bag. Each bag with right weight should be 100 kg while the other having less weight should be 99 kgs. The exact weight of any number of bags can be determined by using a given weighting scale. Write a brute force algorithm to find the stack with less weight in each bag. Determine the worst case complexity of the algorithm.

CO2: Q13) [2 Marks] Write an algorithm for printing the level order data of a Binary tree in reverse order. For example if the level order data is 1 2 3 4 5 6 7 then the algorithm should display the output as 4 5 6 7 2 3 1. Only root is passed as parameter to the algorithm function.

CO2: Q14) [2 Marks] Write an algorithm which does the addition of two different polynomial equations. Select the appropriate data structures for representing the values in a polynomial equation.

5. Answer should be uploaded collectively at the end of examination in a single PDF file with " EnrollmentNo-Name-pdf"of size less than 10MB. *

   Files submitted:

Google Forms