

Roll No:

Gautam Buddha University

Mid Semester Examinations (March, 2021)

Program Name- B. Tech EC, IV Semester (Even)

Course Name: Data Structure and Algorithms Design
Course Code: CS214

Maximum Marks: 15
Total Time: 1.00 Hours

(15 marks)

Instructions: Attempt any *five* questions. (3 marks each). Students have to write their details on the answer sheet and after completing paper make a pdf of the answer sheet by scanning it and send/upload it to the faculty email and mark cc copy to soict.exam@gbu.ac.in .

Email id: aparnaict.gf@gbu.ac.in

Q.1 Find the time complexity of the following code:

```
for (i=n/2;i<=n;i++)  
{  
    for (j=2;j<=n;j=j*2)  
    {  
        k=k+n;  
    }  
}
```

Q.2 Using Quadratic probing method, fill the following keys in a hash table of size 11 using the hash function $k \% 11$.

Keys= 22, 55,98,31,51,80,97,82 and 12.

Q.3 List at least 5 differences between struct and union and also give an appropriate example of your choice where both struct and union can be used.

Q.4 Draw a hash table with chaining resolution method and a table size of 7. Use the hash function of your choice to insert the keys 15, 39, 21, 30,42,18, 60 and 51 into your table.

Q.5 Explain the role of Datatypes. Write various types of datatypes in C.

Q.6 Write an algorithm to find out the transpose of a given matrix by the user.

Q.7 Prove that 4^n is $O(8^n)$