Class Test 2: CSE 207 – Algorithm, Fall 2020
Total Marks: 20, Time: 30 minutes

Question 1 **5**

Solve the following recursion equation using Master method.

$\mathbf{T(n) = a\,T(n/2) + cn^p}$ where a = 2(id%2 + 1) and p = id%3

Question 2 **10**

Create an array of size 12 satisfying the following conditions. Simulate the **Merge sort** for the array you just created.

a) Range of the values should be [id] to [id+40] inclusive (include both id and id+40) where "id" is the last 2 digits of your registration number. Example: If last 2 digits of your registration number are 00, the array should contain values between 0 and 40. If the last 2 digits of your registration number are 05, the array should contain values between 5 and 45.

b) Not more than 2 consecutive numbers should be in ascending order (sorted). As for example you cannot have 7, 3, 5, 9, 6 as part of the array as 3 consecutive numbers 3, 5, 9 are sorted among themselves.

Question 3 **5**

Last week, CSE department of UAP had declared that the department is going to give 10000 taka prize money to 50 students. The students will be picked randomly. The list is published today in our CSE notice board where the students are listed in order of their Registration key. Provide a Divide and Conquer algorithm to find if you are selected as one of those 50 students.