**Algorithm(CS-205),**

**Mid-semester**

**Full Marks – 20  Duration: 2 Hours**

1. To cope up with the down economy minister decided few banks can be merged to reduce operational cost. Initially, there are total n banks. As per the decision either a bank will remain as it is (not merged with any other bank), or can be merged with at most one bank. At the end of this process, number of banks will be in the range of n/2 ..n. However, minister is more interested to understand number of possible combination that is possible.

   Input: n=3

   Output: Number of combination possible is 4

   {1} {2} {3}

   {1,2} {3}

   {1} {2,3}

   {1,3} 2

   Hints: f(n) = ways n bank can be merged

   Consider nth bank. There are two possibilities

   1) It will remain single then we have to think about other n-1 banks
   2) It will be paired up with one of the bank from rest n-1 banks, then removing that pair we will be left with n-2 banks which can be merged in any way.

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