**Algorithms for Computational Biology – 2021**

**Mid-semester Examination**

**Total points: 30; Total time: 1 Hr.**

**(Answer questions worth 30 points only (even if it is a sub-part of a question), if you answer in excess we will only consider first few question cumulatively valued 30)**

1. **Formally define the problem statement associated with motif discovery. Write the pseudocode or steps of a greedy algorithm for motif discovery. [5 points + 5 points]**
2. **Answer in brief (2.5 points each)**
   1. **What are the different algorithmic strategies?**
   2. **Provide an intuitive explanation of Big-Oh and its utility.**
   3. **Do greedy algorithms always give the correct answer? Elaborate.**
   4. **Write a code snippet that leads to logarithmic time complexity.**
3. **Derive the average case time complexity of linear search if you somehow know a priory that the query number definitely exists in the array. [5 points]**
4. **Derive the time complexity of the brute force method for motif discovery. [5 points]**
5. **Define travelling sales person problem and intuitively establish its relationship Shortest Common Superstring (SCS). [5 points]**
6. **Write a short note describing the various steps involved in de novo assembly of genomes. [5 points]**