Daffodil International University

Department of Computer Science and Engineering
Faculty of Science and Information Technology
Final Examination, Semester: Fall - 2019
Course Title: Introduction to Bioinformatics
Course Code: CSE 235   Section: All (Day) Course Teacher: All

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Time: 2 Hours   Full Marks: 40

Answer to the following questions. All the questions contain equal marks.

1. In a Poker game there are ten possible combinations of cards to decide the result of a particular hand. They are **Royal Flush, Straight Flush, Four of a kind, Full House, Flush, Straight, Three of a kind, Double Pair, Pair and High Card**. Two WSOP (World Series of Poker) champions **Phil Hellmuth** and **Daniel Negreanu** were in a Poker battle where **Phil** got **Four of a kind** and **Double pair** with a probability 0.06 and 0.05 in that game. On the contrary, **Daniel** got **Straight Flush** and **Three of a kind** with probability 0.05 and 0.15. The probability of winning two consecutive hands by **Phil** and **Daniel** is 0.45 and 0.55. Now we have results of four Poker hands. If the winning combination of those four hands are **Full House, Four of a kind, Three of a kind** and **Flush** then find out the most expected serial of winner's name for those four hands.

2. Apply FASTA algorithm over the following two sequences where k=1

   Target Sequence: **CCTCCTGCACCACTG**, Query Sequence: **CAGGCACCACCCACG**

3. Find out the probability of occurring the following sequences from the given chart:

   (a) AACCGGTT (b) TTGGCCAA (c) CCAATTGG (d) GGTTAACC (e) ACGTACGT

	A	C	G	T
A	0.18	0.27	0.43	0.12
C	0.17	0.37	0.27	0.19
G	0.16	0.34	0.38	0.12
T	0.08	0.36	0.38	0.18

4. Construct suffix tree, suffix array, and BWT(T) over the sequence **ATCGATCGATCG** and verify your answer by doing LF mapping.