JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATIONS April 2019

PhD II Semester (BT and BI branches)

Course Code: 18M1WBT233   MAX. MARKS: 25
Course Name: Advances in Computational Molecular Evolution   MAX. TIME: 1.5 hrs
Course Credits: 03

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1. Define Jukes and Cantor's one parameter model for nucleotide substitutions for studying evolution along with its derivation.   (CO3)   [5]

Q2. What is codon usage bias in protein coding genes? Define Codon Adaptive Index (CAI) for the codon usage.   (CO2, 3) [4]

Q3. Explain how *Homo sapiens* have only one species at a time however other great apes members have two or more? Provide your scientific opinion.   (CO1-4) [2]

Q4. Define introns evolutionary theories and their significance.   (CO2, 3) [3]

Q5. What is gene duplication? How gene duplication is associated with functional aspects of gene? How you date gene duplication in any species?   (CO2-4) [4]

Q.6. Define following terms:

(a) Genetic drift   (b) Selection   (c) Gene loss   (CO1-4) [1*3=3]

Q.7. Differentiate between the following:

(a) Homology and Homoplasy   (b) Orthologs and Paralogs   (CO1-4) [2*2=4]