J. K. Singh

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
T3 EXAMINATION-MAY 2018
B.Tech (BT and BI) VIII Semester

COURSE CODE: 15B1WBI834 MAX.MARKS: 35
COURSE NAME: Computational Molecular Evolution
MAX. TIME: **2 Hrs**
COURSE CREDITS: 3

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Marks are indicated in square brackets. Calculator is allowed.

1. Compare one and two parameter models of nucleotide substitutions. (CO-1, 2, 3) [3]

2. How you compute the proteins evolutionary events? (CO-2) [2]

3. What are various measures of codon usage? Explain codon usage analysis with an example of a gene with total number of codon = 45. (CO-2, 3) [3]

4. What are various kind of mutations? Explain frameshift mutations and their biological significance. (CO- 1, 3) [2]

5. How you compute the non-functionalization time for a pseudogene? Derive the same for a set of pseudogene. (CO- 2, 3) [4]

6. Discuss various introns theories and their role in evolution. (CO- 3) [3]

7. Explain the three theories of genome evolution with an example of each. (CO- 3) [3]

8. Discuss the role of exon shuffling in evolution through various phases of exons.(CO- 3)[3]

9. Setup and discuss a collaborative procedure through overlapping and nested genes in the process of evolution. (CO- 3) [2]

10. Explain the following: (a) RSCU (b) CAI (c) Conservation and evolution (d) Domains, motifs and evolution (e) C-value in genomes (f) Retro-evolution (g) Selection pressure (h) gene duplication (i) Phylogenetic Information (j) Darwin's assumptions on evolution and his own further modifications (CO- 1, 2, 3) [1*10=10]