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Examination: Odd Semester Examination 2024

Paper Name: Introduction to Bioinformatics, biological Data and databases

Paper Code: MCSB 101

Time: 2.5 Hours

Maximum Marks: 60

Note: This question paper has two sections : Section A and Section B. Assume missing data, if any.

Attempt (i) Section-A: All questions are compulsory.

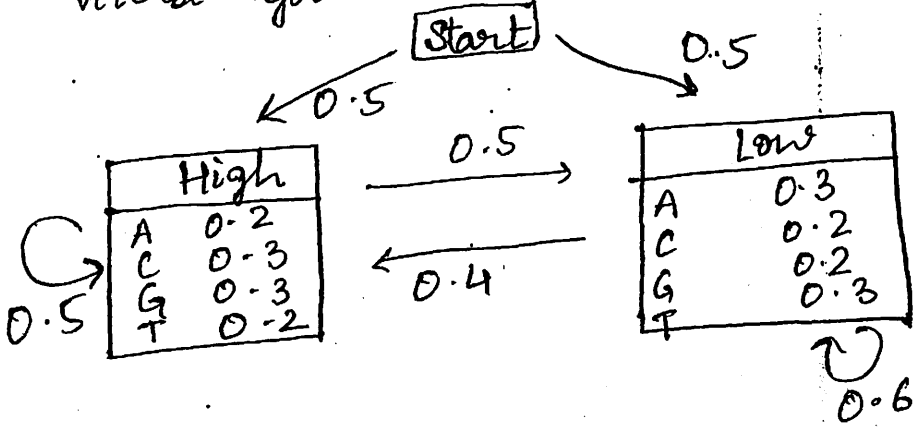
(ii) Section-B: Attempt any FOUR QUESTIONS.

Section –A (All questions are compulsory) 4×5=20 Marks

1. Explain the various structured file format?	CLO1	BL1
2. State the difference between primary database and secondary database? Show graphically, classification of biological databases?	CLO2	BL2
3. What is difference between PAM and BLOSUM scoring matrix? If we take PAM 1 AND BLOSUM 80 compared to PAM 250 and BLOSUM 40, what information would these 2 combinations represent?	CLO3	BL4
4. Explain with diagram how STR analysis for forensic DNA profiling is performed?	CLO2	BL3

Section –B (Attempt any Four questions) 4×10=40 Marks

1. What are the various applications of Bioinformatics?	CLO2	BL3
2. In the given diagram, shaded boxes represents syndrome X. In F1, individual with syndrome X and AB blood group crosses with no disease individual. In F2, all offsprings with allele A has syndrome X. The pedigree chart shows the following details: - P generation: A0 female (shaded circle) × B0 male (shaded box). - F1 generation: AB male with syndrome X (shaded box) × OO female (unshaded circle). - F2 generation: Six offspring. From left to right: A0 male with syndrome X (shaded box), A0 female with syndrome X (shaded circle), B0 female (unshaded circle), A0 female with syndrome X (shaded circle), A0 male with syndrome X (shaded box), and A0 male (unshaded box). - Labels: 'F1' is written to the left of the F1 generation, and 'F2' is written to the left of the F2 generation.	CLO3	BL6

Answer the following questions: - Which offsprings are recombinants and non-recombinants. in F2 generation. - Find the frequency of recombinants and non-recombinants. - Find probability of linkage and probability of non-linkage? - Find LOD score. - What are your observations based on LOD score		
3. Design phylogenetic tree for given set of sequences using UPGMA: Sequence 1 ATCCTGA Sequence 2 CTCCAAA Sequence 3 AAGCTAC Sequence 4 ATGCTGA Sequence 5 ATGGTGT	CLO4	BL5
4. Find the most probable path for GGCA using the given diagram using Viterbi Algorithm. 	CLO5	BL6
5. Explain the triangle of Nucleic acid sequence databases?	CLO1	BL2
6. Explain various steps of CLUSTALW algorithm?	CLO2	BL2