STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI –600 086
(For candidates admitted from the academic year 2008 – 09)

SUBJECT CODE: BI/PC/ME43

M. Sc. DEGREE EXAMINATION, APRIL 2010
BIOINFORMATICS
FOURTH SEMESTER

COURSE : CORE
PAPER : MOLECULAR EVOLUTION
TIME : 3 HOURS **MAX. MARKS: 100**

SECTION - A

I. DEFINE THE FOLLOWING: (7 x 2 = 14)

1. Molecular clock
2. Exon shuffling
3. Substitution model
4. C – Value paradox
5. Molecular tinkering
6. Gene loss
7. Pattern

II. FILL IN THE BLANKS (6 x 1 =6)

8. Orthologs are due to _____
9. _____ is the type of phylogenetic analysis which focuses on derived characters
10. Exons are _____ and introns are _____
11. PAM stands for _____
12. PHYLIP stands for _____
13. KOG is a _____database.

..2

SECTION – B

III. ANSWER ANY FOUR FROM THE FOLLOWING: (4 x 10 = 40)

14. Write detailed account on the aminoacid replacements between two proteins.
15. Give an account on the rate of substitution in organelle DNA.
16. Write short notes on the Tree evaluation methods in detail.
17. Write an account on the substitution matrices.
18. Give an account on the domain duplication and gene elongation.
19. Explain gene distribution in detail.
20. Explain the following

    (i) Gene duplication (ii) Gene loss

    (iii) Functional divergence

SECTION - C

IV. ANSWER ANY TWO FROM THE FOLLOWING: (2 x 20 = 40)

21. Write in detail on the phylogenetic analysis and the tree building methods.
22. Explain Genome size in Eukaryotes in detail
23. Give an account on the concerted evolution in detail
24. Write detailed account on the sequence alignment techniques.

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