STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI –600 086
(For candidates admitted from the academic year 2006 – 07 & thereafter)

SUBJECT CODE: BI/PC/MB24

M. Sc. DEGREE EXAMINATION, APRIL 2008
BIOINFORMATICS
SECOND SEMESTER

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

SECTION – A

ANSWER ALL QUESTIONS **(5 X 1=5)**

I FILL IN THE BLANKS:

1. The genetic material of mitochondria and chloroplasts is located inside the organelle in a region known as the _____.
2. Along the inner nuclear membranes are found a collection of proteins known as _____.
3. During DNA replication process, DNA helicase, primase and several accessory proteins form a multiprotein complex known as a _____.
4. To begin transcription an enzyme known as _____ binds to the promoter region.
5. _____ and his colleagues found that DNA has a striking biochemical composition in which the amount of A equals T and the amount of G equals C.

II MATCH THE FOLLOWING: **(4 x 1 = 4)**

6.	Helicase	-	Removes RNA primers
7.	Primase	-	Synthesizes DNA in the leading and lagging strands.
8.	DNA Polymerase III	-	Synthesizes short RNA primers
9.	DNA Polymerase I	-	Separates double stranded DNA.

III WRITE TRUE OR FALSE: **(5 x 1 = 5)**

10. Post translational control can either activate or inhibit the function of a protein.
11. A repressor is a regulatory proein that binds to the DNA and inhibits transcription.
12. During G1 phase the cell accumulates the materials that are necessary for nuclear and cell division.
13. A translational regularly protein recognizes sequences within the mRNA much as transcription factors recognize DNA sequences.
14. The A – T / G – C rule implies that base sequences within two DNA strands are complementary to each other.

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IV WRITE SHORT NOTES ON: (3 x 2 = 6)

15. Tandem array.
16. Transposable elements.
17. Topoisomerases.

SECTION – B

ANSWER ANY FOUR QUESTIONS. (4 X 10 = 40)

18. Describe the characteristics of Repetitive sequence in Eukaryotic genomes.
19. What is meant by the term transcription factor modulation? Explain it with steroid receptor.
20. What is feedback inhibition? At the cellular level explain why feedback inhibition is useful.
21. What types of genetic activities occur during interphase? Explain why these activities cannot occur during M phase.
22. Describe the initiation of Transcription in Eukaryotic gene.
23. What is meant by the term attenuation? Is it an example of gene regulation at the level of transcription or translation? Explain your answer.
24. Explain the proof reading function of DNA polymerase.

SECTION – C

ANSWER ANY TWO QUESTIONS. (2 x 20 = 40)

25. Discuss the structure and organization of the mitochondrial and chloroplast genomes. How large are they, how many genes do they contain and how many copies of the genome are there per organelle.
26. What are the three stages of translation in Eukaryotes? Discuss the main events that occur during these three stages.
27. Describe the molecular events occur during I meiosis.
28. a) What is DNA methylation? How is it passed from a mother to a daughter cell.
    b) Discuss the difference between Rho-dependent and Rho-independent termination of transcription in Prokaryotes.

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