

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

SUBJECT CODE : BI/PC/MB24

M. Sc. DEGREE EXAMINATION, APRIL 2007

BIOINFORMATICS
SECOND SEMESTER

COURSE : CORE

PAPER : MOLECULAR BIOLOGY

TIME : 3 HOURS

MAX. MARKS : 100

SECTION – A

ANSWER ALL QUESTIONS

(5 X 1=5)

I Choose the correct answer:

1. During cell division replication of DNA and synthesis of histone protein occur in
a) S-phase b) G1-phase c) G2-phase d) M-phase
2. Which of the following sequences would be a good context for eukaryotic ribosomal initiation.
a) GACGCCAUGG b) GCCUCCAUGC
c) GCCAUCAAGG d) GCCACCAUGG
3. If a tRNA has an anticodon sequence 3'-CCI-5' what codon can it recognize?
a) 5'-GGU-3' b) 5'-GGC-3' c) 5'-GGA-3' d) all the above
4. Which component is required for transcription?
a) RNA polymerase b) Four different ribonucleosides c) Mg²⁺ d) All the above
5. _____ studied regulation of lactose Operon in E.coli.
a) Watson and Crick b) Jacob and Monod
c) Britten and Davison d) Altman and Blum

II Fill in the blanks:

(6 x 1 = 6)

6. The second meiotic division is also known as the _____.
7. Retrovirus contain an enzyme called _____.
8. A strand during DNA replication that is synthesized continuously towards the replication fork is called _____.
9. The process in which pieces of RNA are removed and the remaining pieces are covalently attached to each other is _____.
10. A sequence within a gene that signals the end of the transcription is _____.
11. Post-transcription control operate during _____.

III Match the following:

(3 x 1 = 3)

- | | |
|-----------|-----|
| 12. Amber | UGG |
| 13. Opal | UAG |
| 14. Opal | UAA |
| | UGA |

IV Write in one or two sentences: (3 x 2 = 6)

15. Shine-Dalgarno sequence
16. Promoter
17. Okazaki fragments.

SECTION – B**ANSWER ANY FOUR QUESTIONS. (4 X 10 = 40)**

18. Explain replicative transposable elements.
19. Describe the mechanism of initiation of E.coli DNA replication.
20. What is DNA methylation? How is it passed from a mother to a daughter cell?
21. Discuss the structure and organization of the mitochondrial and chloroplast genome? How large are they, how many genes do they contain, and how many copies of the genome are there per organelle?
22. Define the terms: Cell cycle and mitosis. Name the stages of cell cycle. Which is usually the longest stage? What are the major features of each mitotic phase?
23. Give an account of repetitive sequences.
24. What is the mechanism of action of steroid hormones in controlling gene expression.

SECTION – C**ANSWER ANY TWO QUESTIONS. (2 x 20 = 40)**

25. What are the three stages of translation? Discuss the main events that occur during these three stages.
26. a) What is meiosis? Describe the main features of each meiotic phase.
b) Write critical notes on synaptonemal complex.
27. Write an essay on Genetic control of Vertebrate Immune system.
28. a) Describe the structure and working of lac Operon.
b) Draw a diagram showing the controlling region of lac Operon of E.coli.



