

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2004-05 & thereafter)

SUBJECT CODE : **PH/MO/BO34**

B.Sc. DEGREE EXAMINATION NOVEMBER 2007
BRANCH III - PHYSICS
THIRD SEMESTER

COURSE : **MAJOR – OPTIONAL**
PAPER : **BIOPHYSICS**
TIME : **3 HOURS** MAX. MARKS : **100**

SECTION – A

ANSWER ALL QUESTIONS: (10 x 3 = 30)

1. Give two examples each of strong and weak interactions.
2. What is meant by chirality?
3. What is polymorphism?
4. Draw a diagram to show the use of the torsion angles ϕ and Ψ for describing the conformation of a polypeptide chain.
5. State three differences between DNA and RNA.
6. How is information transferred from DNA to proteins?
7. What are striated muscles?
8. What is the role of Ca^{2+} ions in muscle contraction?
9. What is the principle of EEG?
10. Draw a schematic representation of a SEM.

SECTION – B

ANSWER ANY SIX QUESTIONS: (6 x 5 = 30)

11. Explain the formation of the hydrogen bond. Give an example.
12. Discuss the super coiling of DNA.
13. Explain the importance of the Ramachandran diagram.
14. Distinguish between globular and fibrous proteins.

15. Explain with the help of a diagram, what is a synapse.
16. What are the stages in the development of the action potential across a membrane?
17. Outline the instrumentation involved in ECG.
18. Demonstrate the generation of the coordinates for a simple molecule.

SECTION – C

ANSWER ANY TWO QUESTIONS:

(2 x 20 = 40)

19. Explain the primary, secondary, tertiary and quaternary structure of proteins.
20. Explain the energy cycle and the concept of free energy.
21.
 - a) Discuss the bio physical aspects of nerves.
 - b) Explain the bio electricity in the brain.
22. Discuss the importance of X-ray crystallography in understanding the structure of macromolecules.
23. Write short notes on
 - a) DNA structure
 - b) Peptide bond
 - c) Nerve cell
 - d) Muscle twitch.

