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 2008
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.   Why are molecular interactions weak?

2.   State three features of the covalent bond.

3.   What is polymorphism?

4.   Draw a diagram to show the torsion angles.

5.   Give two examples each of globular and Fibrous proteins.

6.   Define resting potential and action potential.

7.   What is muscle twitch?

8.   What is the principle of EEG?

9.   What is the objective of molecular modeling?

10.   What information is obtained through x-ray diffraction studies?

SECTION – B

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

11.   Explain the formation of hydrogen bond giving an example.

12.   Explain the structure of DNA.

13.   Describe the peptide bond and its importance.

14.   How is an impulse transmitted?

15.   Discuss the mechanical properties of muscles.

16.   Explain the importance of Ramachandran diagram.

17.   Describe the instrumentation of ECG.

18.   How is a molecular model optimized and displayed.

SECTION – C

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

19.   a) What are hydrophobic interactions? Give examples.

   b) State Bragg's law of Diffraction? How do you collect XRD data using
       diffractometer.   (10 + 10)

20.   a) Explain Polymorphism of DNA.

   b) Explain what is meant by conformation. Distinguish between allowed and
       disallowed conformations.   (10 + 10)

21.   Discuss the Primary, Secondary, tertiary and quaternary structure of proteins.

22.   a) Describe a nerve cell and explain the biophysical aspects of nerves.

   b) Describe the structure of muscles. Explain how muscle contraction is
       triggered.   (10 + 10)

23.   a) Draw a neat diagram of the scanning electron microscope and explain its
           working.

   b) Discuss how a model for a protein is generated.   (10 + 10)

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