

M. Sc. DEGREE EXAMINATION, APRIL 2011
BIOINFORMATICS
SECOND SEMESTER

COURSE : MAJOR – CORE
PAPER : BIOPHYSICS
TIME : 3 HOURS

MAX. MARKS: 100

SECTION – A

ANSWER ALL THE QUESTIONS

(20 x 1 = 20)

Define / Explain the following:

1. Explain stokes and antistokes line.
2. What is absorption and emission spectra?
3. Define Fluorescence.
4. Explain entropy of a system.
5. State the laws of thermodynamics.
6. Explain Chemical Shift.
7. Explain Spin-Spin interaction.
8. Explain 2D NMR.
9. Give the applications of Infrared Spectroscopy to nucleic acid.
10. What is meant by denaturation?
11. Define resolution in X-ray diffraction technique.
12. Why X-ray is used to determine the structure of macromolecule?
13. What is super saturated state in crystallography?
14. Define Bragg's law
15. Give the peptide ion fragmentation take place in MS-MS analysis
16. How the sequest algorithm works?
17. Explain the term goniometer in crystallography
18. Explain the principle of mass spectrometry
19. Give the applications of chemical force microscopy
20. What are the methods available to determine the 3D structure of a molecule?

SECTION - B

Answer any FOUR of the following; each answers not exceeding 500 words. Draw diagram wherever necessary. (4x10=40)

21. Explain the basic principle of atomic force microscopy and describe its applications.
22. Explain the basic theory of fluorescence spectroscopy.
23. Explain the relationship between entropy, enthalpy and free energy.
24. Describe the methods for crystal growth.
25. ATP is the universal currency for free energy in biological system – explain the statement.
26. What are thermodynamic principles? Give an account on spontaneity of biological reactions?
27. Write short notes on relaxations and intramolecular shielding.

SECTION - C

Answer any TWO of the following, each answer not exceeding 1200 words. Draw diagram wherever necessary. (2x20=40)

28. Explain in detail the principle, operation of NMR spectroscopy technique. Give its applications to biological molecules.
29. Write notes on MALDI mass spectrometer and explain about the mass analyzers.
30. Write an essay on the principle and application of Infrared spectroscopy for studying biomolecules.
31. How are the 3D macromolecular structure elucidated by x-ray diffraction methods.
