

CBCS SCHEME

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15BT45

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Structural Biology

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Draw the Ramchandran plot and explain its effectivity in representing stable conformations of proteins. (06 Marks)
- b. Explain briefly
(i) Hills constant (ii) Adenylates. (10 Marks)

OR

- 2 a. Elucidate the structure of fibrous proteins considering collagen and keratin as examples. (10 Marks)
- b. Discuss in detail various interactions that stabilize tertiary folds in protein structure. (06 Marks)

Module-2

- 3 a. What are Nucleic acids? Explain the constituents of the principle chain of a nucleic acid with necessary structural formulation. (10 Marks)
- b. Outline the dynamics and structural fluctuation of ribose sugar in DNA. (06 Marks)

OR

- 4 a. Discuss about the transport mechanism observed in biological membranes. Comment on membrane potential and transport of ions through membrane. (10 Marks)
- b. Distinguish between external, integral and internal membrane proteins. (06 Marks)

Module-3

- 5 a. Explain the Rayleigh scattering method of determining the molecular mass of small molecules. (08 Marks)
- b. Explain the principle, construction and working of SEM. (08 Marks)

OR

- 6 a. Elaborate in detail luminescence and its application. (08 Marks)
- b. Explain the principle, technique and application of MALDI-TOF spectroscopy. (08 Marks)

Module-4

- 7 a. Explain the construction and working of NMR. (10 Marks)
- b. Explain as to how CD technique assists in elucidation of structure and function of biomolecules. (06 Marks)

OR

- 8 a. Elucidate the steps involved in single crystal X-ray diffraction technique towards determining the structure and function of a biomolecules. (10 Marks)
- b. Enumerate the role of UV-spectroscopy elucidating the structure of biomolecules. (06 Marks)

Module-5

- 9 a. Give a detailed note on protein interaction with other biomolecules for various biological functions. (10 Marks)
- b. Discuss the importance of molecular simulation techniques with respect to biological functions. (06 Marks)

OR

- 10 a. Give a detailed note on supramolecular interaction of biomolecules for stable structure formation. (10 Marks)
- b. Discuss on Protein - Nucleic acid interactions. (06 Marks)
