

L-7/2050
BIO-PHYSICAL CHEMISTRY AND
ADVANCED SPECTROSCOPY-432
(Semester-IV)

Time : Two Hours]

[Maximum Marks : 55

Note : Attempt any *four* questions. All questions carry equal marks.

- I. Discuss thermodynamically proteins folding and their stability.
- II. (a) Explain primary, secondary and high order structures of proteins with suitable examples.
(b) Discuss application of Lasers.
- III. (a) Describe laser action with respect to 4-level laser by taking a suitable example.
(b) Discuss hydrophillic interactions in Biological systems.
- IV. Discuss the kinetics of protein-drug and protein-surfactant interactions.
- V. Describe principle and basic instrument in mass spectrometer. How it can be used for the estimation of bond dissociation energy and electron affinities ? Explain.
- VI. Discuss principle and experimental technique involved in Photon Electron spectrometer. Also draw its block diagram.

- VII. (a) State and Explain Koopman's theorem.
- (b) Give in brief Atomic photo Electron spectra of K_r and X_e . Also discuss Effect of spin-orbit coupling.
- VIII. Write a note on the followings :
- (a) HCl and HF lasers.
- (b) Application of Frank-Condon principle to photonelectron spectra.
- IX. Answer in short :
- (a) Why pH of a solution lies in the range 0-14 ?
- (b) What are intrinsic semiconductors ?
- (c) Explain basic principle of laser.
- (d) What is XPS ?
- (e) Discuss the effect of temperature on the stability of proteins.
- (f) What is meant by stimulated Raman scattering ?
- (g) Give applications of masers.
- (h) What are Enzymes ?
- (i) State whether Ruby laser is 3 or 4 level laser ?
- (j) Explain semiconductor diode laser.
- (k) Define Frank Condon principle.
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