

NKT/KS/17/5123

Bachelor of Science (B.Sc.) Semester—III (C.B.S.) Examination**BIO-CHEMISTRY (Biophysical Techniques—I)****Paper—II**

Time : Three Hours]

[Maximum Marks : 50

Note :— (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw labelled diagrams wherever necessary.

1. (a) Describe the concept of orbital theory and electro-magnetic radiations. 5
 (b) What is Beer's law ? What factors causes deviations from Beer's law ? 5

OR

Write notes on :

- (c) Molar extinction coefficient 2½
 (d) Chromophores and auxochromes 2½
 (e) Diffraction grating 2½
 (f) Applications of UV-VIS spectrophotometry. 2½
2. What is fluorescence ? Describe in detail the principle, instrumentation and application of spectrofluorometry. 10

OR

- (a) Define buffers. Describe in detail the mechanism of buffer action with suitable example. 5
 (b) Write a note on combined glass electrode. 5
3. (a) Describe the principle of gel filtration chromatography. 2½
 (b) Write a note on concept of plates in column chromatography. 2½
 (c) Describe partition coefficient. 2½
 (d) Write a note on 'column efficiency'. 2½

OR

- (a) Describe TLC in detail. 5
 (b) Describe ascending and descending paper chromatography. 5

4. (a) Write a note on 'Ion Exchangers'. 2½
 (b) Write a note on specific and non-specific elution. 2½
 (c) Describe the principle of gas chromatography. 2½
 (d) What are the applications of HPLC ? 2½

OR

Describe in detail the principle, instrumentation and working of HPLC. 10

5. Solve any *ten* of the following :
- (i) What is λ_{\max} ? 1
 (ii) Define hyperchromic shift. 1
 (iii) What is meant by Bathochromic shift ? 1
 (iv) Define pH. 1
 (v) Define R_f value. 1
 (vi) Define RT (Retention Time). 1
 (vii) Name any two carrier gases used in gas chromatography. 1
 (viii) What is exclusion limit of a gel ? 1
 (ix) Name any one buffer present in RBC. 1
 (x) Which ligand molecule is used for separation of polysaccharides and glycoprotein using affinity chromatography ? 1
 (xi) Mention any two advantages of HPLC over conventional chromatography techniques. 1
 (xii) What is buffer capacity ? 1