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 convential chromatography techniques. 1

(xii) What is buffer capacity ? 1