

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-3 EXAMINATIONS-2022

B.Tech-IV Semester (BT)

COURSE CODE (CREDITS): 10B11PH212 (4)

MAX. MARKS: 35

COURSE NAME: Biophysical Techniques

COURSE INSTRUCTORS: Dr. Ragini Raj Singh

MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q.1. Write Short answers on:

[2 x 5=10]

- (i) Give reasons to use Fourier transform infrared spectroscopy as preferred infrared spectral analysis.
- (ii) How is the composition of secondary structure determined using FTIR?
- (iii) Stokes shift and Mirror image rule
- (iv) ESEM
- (v) Mirror image rule and its deviations and Stokes shift in PL

Q.2. Discuss the necessary conditions for IR absorbance. What are the different vibrational modes, discuss them with the help of diagrams? [5]

Q.3 What is quantum yield of fluorescence and how to measure quantum yield? [5]

Q.4. What is Raman effect? Explain the quantum and classical theory of Raman scattering with the help of equations and diagrams. [5]

Q.5. Discuss each for Analysis of biomolecules using Mass spectrometry [5]

- (i) Structure and purity
- (ii) Identification of chemical modifications
- (iii) Protein sequencing
- (iv) Peptide fragmentation
- (v) Protein identification

Q.6. Explain all the basics of mass spectrometry. Also discuss the basic instrumentation from heat chamber to detection. [5]