JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION- April 2022
B.Tech VI Semester

COURSE CODE: L-18B1WBT633   MAX. MARKS: 25
COURSE NAME: Nano-Biotechnology
COURSE CREDITS: 3   MAX. TIME: 1.5Hr

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

1. Discuss in detail about Dynamic Light Scattering and address the importance of Stokes-Einstein equation for size measurement using DLS. Also address the advantages and limitations of DLS. [3] [CO-3]

2. List out the different properties of nanomaterial? Compare these with the properties of bulk materials. Cite appropriate example and add a note on different form of nanomaterials. [4] [CO-1]

3. A compound has a stokes shift as showed in the figure. Detail out the reasons behind this spectral shift [2] [CO3]
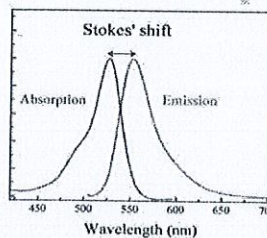
4. Enlist the physio-chemical methods of obtaining nanomaterials and detail out the biological route of nanomaterial synthesis. State the advantages of these methods, over other methods, if any. [5]. [CO-2]

5. Who is credited with the invention of the first scanning electron microscope? Compare the resolving power of electron microscope working with two different energy source having wavelength $0.1 A^{\circ}$ and $0.001 A^{\circ}$ respectively. [3] [CO-3]

6. How do you synthesize silver nanoparticles using photochemical reactions (UV illumination process) in an aqueous solution containing silver nitrate as a reactant and PVA as a stabilizer? Write the photochemical reaction occur during this process. [3] [CO-2]

7. Calculate the spin multiplicity for singlet excited and triplet excited state. [2] [CO-3]

8. Label the following Jablonksi diagram (A-H) [3] [CO-3]