JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- Feb-2025

Course Code (Credits): 20MSWBT231 (2) Max. Marks: 15

Course Name: NanoBiotechnology

Course Instructors: Dr.Abhishek Max. Time: 1 Hour

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

Q.N	Question	Marks
Q1	A Globular protein was examined by electron microscope and the size of the protein measured about 250 A^{o} in diameter. If volume of the globular protein is 0.50 mm^3 and the volume of single amino acid is 0.25nm^3 then what would be the number of amino acid in protein.	[3]
Q2	Ouchterlony double immunodiffusion (also known as passive double immunodiffusion) is an immunological technique used in the detection and identification of antibodies and antigens. The immune complex precipitates in the gel to give a thin white line (precipitin line), which is a visual signature of antigen recognition. To perform this assay you need 200 µl of 0.25 nM antibody and 200 µl of 0.25 nM antigen solution. How will you prepare exactly 200 µl of 0.25nM antibody and antigen solution from a 10 mM and 100 µM antibody and antigen stoke solutions?	[4]
Q3	Nanomaterials can be synthesized by a number of techniques, including chemical, biological, seeded growth, physical, and electrochemical approaches. Every methods has advantage and limitation of its own. Give a detailed explanation of the physical methods of nanomaterials, focusing on PVD and electric arc methods. You should also discuss the benefits and drawbacks of physical methods compared to chemical ones.	[5]
Q4	Nanotechnology involves the understanding and control of matter at the nanometer-scale, so-called nanoscale deals with dimensions between approximately 1 and 100 nanometers. On the nanometer-scale, materials may exhibit unusual or unique properties. List out all the unique property you will observe at nanoscale.	[3]