JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- FEB-2023

Course Code(Credits): 18B1WBT633 (3) Max. Marks: 15

Course Name: Nano-Biotechnology

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

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

1. Even though nanoscience is often perceived as a science of the future, it is actually the basis for all systems in our living and mineral world. We see hundreds of examples of nanoscience right in front of our eyes every day e.g. a man beard grow 4.89 nm/s and a human fingernails grow approximately 1.02 nm/s. What would be the value of beards growth and fingernails growth in cm/s and angstrom/s. [4] [CO-1]

2. A student has 10 ml of paint and he would like to paint a wall of area 10,000 m2. What would be the thickness of the paint [1] [CO-1]

3. Although nanotechnology is a fairly new science, the chief concepts have been developing over the course of fifty years but the modern history of metal nanoparticles is said to be started with the synthesis of gold colloid By Michal Faraday in 1857. Detail out the synthesis mechanism of colloidal gold nanoparticles used by Faraday [3] [CO-2]

4. Nanoscience is not just the science of the small, but the science in which materials with small dimension show new physical phenomena, which are size-dependent and dramatically different from the properties of macroscale materials. Give a detail comparison of the properties of bulk material with nanoscale materials and also illustrate the significance of Moore law in microelectronics. [3] [CO-1]

5. In 1959, the physicist Richard Feynman, Nobel Prize winner for Physics in 1965, came up with the brilliant concept of the nano when he said "there is plenty of room at the bottom" during a conference of the American Physical Society. What do you understand by this statement? Elaborate it. [1] [CO-1]

6. Several methods have been developed to produce nanoparticles. Two synthesis approaches have been identified that is top-down and bottom-up approach. Top-down methods comprise of ball milling, melt mixing and PVD etc. Detail out the melt mixing and laser ablation methods of nanomaterial synthesis and also write down the significance of both the methods. [3] [CO-2]