

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- MAY-2025

M.Sc II Semester (BT)

Course Code (Credits): 20MSWBT231 (2)

Max. Marks: 35

Course Name: NanoBiotechnology

Course Instructors: Dr.Abbishek

Max. Time: 2.0 Hour

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

Q.N	Question	Marks
Q1	Biological deterioration, poor water solubility, inadequate bioavailability, and unintentional intrinsic adverse effects are common limitation of conventional drug delivery system. Explain with suitable example, why the easiest way to get around these limitations is to use nanocarrier-based drug delivery system. Also describe targeted drug delivery system and their advantages.	[5+2]
Q2	Nanocarriers have been extensively investigated in the past few decades as they showed great promise in the area of drug delivery. There are diverse types of nanocarriers that have been synthesized for drug delivery, including dendrimers, liposomes, solid lipid nanoparticles, polymersomes, colloidal nanocarrier, polymeric nanoparticles, and metal nanoparticles. Using an appropriate example, describe the following nano-carrier and their applications in passive drug delivery systems. a. Niosome b. Liposome c. Pharmacosomes d. Gold Nanoparticles e. Signify the Role of EPR and RES system in drug delivery system	[1.5+1.5 +1.5+2]
Q3	Nanodiagnostics involve the use of nanotechnology in clinical diagnosis to meet the demands for increased sensitivity and early detection in less time. Nano-enable detection exhibit exceptional sensitivity, specificity, and the capacity to recognize multiple molecules, making them suitable for detecting extracellular cancer biomarkers, Nanomaterials also come into play for the sensitive detection of cancer cells. Provide a nanoparticle-based early cancer cell detection strategy with neat and clean diagram.	[5]
Q4	Dynamic light scattering (DLS) is widely used for characterizing nanoparticles in various applications, offering a non-invasive way to measure their size, distribution, and stability. a. Illustrate the working mechanism of DLS b. Signify the importance of Stokes-Einstein equation in DLS analysis. c. Mentioned the advantages and disadvantages of DLS.	[3+2+2]
Q5	Physical vapor deposition (PVD) is one of the important method for preparing nanomaterials. PVD involves converting a solid material into a vapor phase through	[5+1]

	physical processes. Detail-out PVD with suitable ray diagram, various steps involve in the synthesis and the advantages of PVD.	
Q6	<p>a. The Lycurgus Cup, a Roman artifact from the 4th century AD, is a prime example of ancient nanotechnology, why?</p> <p>b. Richard Feynman is renowned in nanotechnology for his visionary 1959 lecture, what was the title of that famous lecture?</p>	2

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