Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U9C73

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Open Elective

Biotechnology

21UBT973-BIO NANOTECHNOLOGY

(Common to All Engineering branches)

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1.	Mention some effects of size reduction of nanoparticles (NPs)?	CO1-U
2.	Contrast top-down and Bottom-Up approach in NP synthesis	CO1-U
3.	List the advantages and disadvantages of Ball mill method	CO2-U
4.	State the differences between quantum wire and quantum well.	CO2-U
5.	How does scanning tunneling microscope work function?	CO1-U
6.	What are the limitations of AFM?	CO1-U
7.	Give notes on functions of carbohydrates and proteins	CO2-U
8.	Explain the mechanism of biological systems at nanoscale	CO2-U
9.	How many types of nanomedicine are there?	CO2-U
10.	What is the principle of nano-drug delivery?	CO2-U

PART – B (5 x 16= 80 Marks)

11.	(a)	Generalize the effects of length scales involved and effect on properties in nanoparticles.	CO1-U	(16)
		Or		
	(b)	Discuss the role of bottom up approach in nanotechnology with neat sketch	CO1-U	(16)

12.	(a)	Explain with necessary diagrams the synthesis of nanomaterials using the following methods (i) Chemical Vapour deposition. (ii) Sol-gel method.	CO2-U	(16)
		Or		
	(b)	Write notes on mechanical grinding and wet chemical synthesis for synthesis of nanoparticles and their advantages, disadvantages with neat sketch	CO2-U	(16)
13.	(a)	Outline the importance of X-ray photoelectron spectroscopy in characterization of nano materials with neat sketch and list their advantages and disadvantages.	CO3-App	(16)
		Or		
	(b)	Identify any two microscopy methods for characterization of nanoparticles with neat sketch and list their advantages and disadvantages.	CO3-App	(16)
14.	(a)	Examine the recent advancements in biophotonic sensors for medical diagnostics. Explain in details	CO4-App	(16)
		Or		
	(b)	Apply the concept of biological motors and its types for muscle contraction and relaxation in cells	CO4-App	(16)
15.	(a)	Explain nano-material integrated targeted drug delivery with neat sketch.	CO1-U	(16)
		Or		
	(b)	Explain how Nano silver crystalline used for Bacterial inhibition.	CO1-U	(16)