Total number of printed pages: 01 **PG/2nd/PFET2122**

2023

Nanomaterial Synthesis and Characterization Techniques

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	Define Nanotechnology and Nanoparticles.	5
	b)	What are the applications of nanotechnology in food industry?	5
	c)	Differentiate among 0D, 1D, 2D and 3D nanomaterials by giving suitable examples.	5
	d)	What do you understand by top-down approach of nanomaterial synthesis?	5
2.	Write notes on any four (4) of the followings		4*5=20
	a)	Carbon nanotubes (CNT)	
	b)	Graphene	
	c)	How small is nano?	
	d)	Buckyball	
	e)	Atomic layer deposition (ALD)	
3.	a)	What do you mean by green synthesis of nanoparticles?	5
	b)	With the schematic diagram describe the synthesis of nanoparticles using plant-extract. Also, write the mechanism of synthesis.	5+10
4.	a)	What is the role of microbes in green synthesis of nanoparticles.	10
	b)	With the schematic diagram describe the microbial synthesis of gold nanoparticles.	10
5.		Write notes on any four (4) of the followings	4*5=20
	a)	Hydrothermal synthesis	
	b)	Sol gel method for nanoparticle synthesis	
	c)	Chemical vapor deposition (CVD)	
	d)	FTIR spectroscopy	
	e)	X-ray diffraction (XRD)	
6.	a)	Discuss the working principle of UV-vis spectroscopy.	10
	b)	Explain how to characterize a material with scanning electron microscope (SEM) with neat sketch.	10