Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree (S, FE) Examination January 2023 (2015 Scheme)

Course Code: MR403

Course Name: Nanotechnology

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks. Marks

1		Illustrate the concept of top down approach in nanotechnology with an example?	(5)
2		Discuss how Gold nanoparticles are synthesized by colloidal method. What are their properties?	(5)
3		"Transmission Beam Microscopy permits smooth penetration of electron beam through the specimen". Validate the given statement with various steps involved in specimen preparation of TEM.	(5)
4		Discuss the need for self assembly process in nano fabrication. Explain how layer by layer assembly is carried out?	(5)
5		What are various risk factors to be considered while handling nanomaterial?	(5)
6		With necessary figure explain the impact of photoresists when they are coated on the surface of the substrate.	(5)
7		Write short note on MEMS?	(5)
8		How are Nano sensors made? Explain types of Nano sensors.	(5)

PART B

Answer any three full questions, each carries 10 marks.

9	a)	Explain various properties that differ when a material is reduced from bulk to Nano scale.	(7)
	b)	Why does this property variation occur?	(3)
10		With neat sketch explain Sol-Gel Process in detail.	(10)
11	a)	Discuss about several methods that are being used for fabrication of Carbon Nano Tube (CNT). How CNTs are classified?	(10)

12	a)	"Thermal conductivity of Nano fluids increases when Nano sized solids are dispersed in it". Justify the statement.	(5)
	b)	How two step preparation method of Nano fluids differ from that of single step method?	(5)
13	a)	Explain 0D, 1D, 2D, 3D nanomaterial with examples. Plot the variation density graph for each structure.	(5)
	b)	Explain biological synthesis of nanoparticles.	(5)

PART C

Answer any two full questions, each carries 15 marks.

14	a)	What are various potential human hazards that can be caused due to exposure to nanoparticles? How can we prevent such hazards?	(15)
15	a)	Explain about micro and Nano fabrication techniques.	(15)
16	a)	What are Dendrimers? Explain with suitable classifications. Write some of its applications.	(15)
17	a)	Discuss in detail about any three areas where Nanotechnology found its application.	(15)

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