U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September 2024 Supplementary Examinations

Programme: B.E. **Semester: I / II**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 23CY1ETNST / 23CY2ETNST **Max Marks: 100**
Course: Nanoscience and Technology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

		UNIT - I	CO	PO	Marks
1	a)	Summarize the classification of nanomaterials based on their dimension with suitable examples.	1	1	**6**
	b)	List the properties and applications of fullerenes.	1	1	**6**
	c)	Analyze the following size dependent properties of nanomaterials: (i) Catalytic (ii) Mechanical (iii) Optical.	1	1	**8**
		UNIT – II			
2	a)	Distinguish between bottom-up and top-down approach to synthesize nanomaterials. List the disadvantages of bottom-up approach.	2	1, 2	**6**
	b)	State Bragg's law. Describe the interpretation of the powder X-ray diffraction data (XRD) to analyse the nanomaterials.	2	1, 2	**6**
	c)	Elaborate the co-precipitation method to synthesize nanomaterials and list its advantages and disadvantages.	2	1, 2	**8**
		OR			
3	a)	State Beer-Lambert's law. Outline the process of UV-Visible spectroscopy to analyze the nanomaterials.	2	1, 2	**6**
	b)	Explain scanning electron microscopy (SEM) used to characterize nanomaterials. Summarize its applications.	2	1, 2	**6**
	c)	Describe the principle and procedure for chemical vapor deposition (CVD) method to synthesize nanomaterials and list its advantages.	2	1, 2	**8**
		UNIT – III			
4	a)	Summarize the advantages and disadvantages of nanomaterials in medicine.	3	6,7	**6**
	b)	Outline the production of hydrogen by electrolysis of water using nanomaterials.	3	6,7	**6**
	c)	Discuss the various nanomaterials used in cosmetics.	3	6,7	**8**

			OR			
	5	a)	Outline the function of nanomaterials in battery technology.	3	6,7	**6**
		b)	Summarize the role of nanomaterials in agriculture field.	3	6,7	**6**
		c)	Discuss the following: (i) Quantum dot solar cells (ii) Thin film solar cells.	3	6,7	**8**
			UNIT – IV			
	6	a)	Describe the defluorination of water using MgO nanoparticles by adsorption technique.	3	6,7	**6**
		b)	Analyze the role of nanofiltration in water treatment.	3	6,7	**6**
		c)	Discuss the following factors affecting photocatalytic activity: (i) electron hole pair separation rate (ii) structure, phase and morphology of the catalyst (iii) intensity and wavelength of incident light.	3	6,7	**8**
			UNIT – V			
	7	a)	Elaborate on the role of nanomaterials on environment.	3	6,7	**6**
		b)	Summarize the toxicity effect of various nanomaterials.	3	6,7	**6**
		c)	Discuss the future implications of nanotechnology in various fields.	3	6,7	**8**

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