U.S.N.										

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

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: VII**
Branch: Institutional Elective **Duration: 3 hrs.**
Course Code: 21CY7IEFME **Max Marks: 100**
Course: Functional Materials for Engineering Applications

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

1	a)	Attribute the significance of Functional materials for Engineering applications with examples.	**6**
	b)	Summarize on carbon allotropes and their importance.	**6**
	c)	Illustrate the preparation of CNTs by Laser Ablation method.	**8**

OR

2	a)	Outline the properties of CNTs and their applications.	**6**
	b)	Discuss the properties and importance of CNTs in energy storage applications.	**6**
	c)	Justify the statement: Plasma treatment improves the properties of CNTs.	**8**

UNIT - II

3	a)	Apprise the statement: Performance of graphene is associated to its properties.	**6**
	b)	Discuss the Electrical and Mechanical properties of Fullerene.	**6**
	c)	Describe the preparation and properties of YBCO.	**8**

UNIT - III

4	a)	Illustrate the preparation of MOFs and their importance.	**6**
	b)	Brief the technological importance of ceramic-matrix nanocomposites.	**6**

	c)	Describe the process of $Al(acac)_3$ synthesis and confirm the formation by various characterization methods.	**8**

UNIT - IV

5	a)	Distinguish between Intrinsic and Extrinsic semiconductors.	**6**
	b)	Discuss the importance of perovskite materials and their properties.	**6**
	c)	Brief the preparation of GaAs thin film by MOCVD method.	**8**

OR

6	a)	Justify the statement: GaAs is a semiconductor material. Write its application.	**6**
	b)	Describe the preparation of $LaYbO_3$.	**6**
	c)	Brief the photovoltaic applications of perovskite materials.	**8**

UNIT-V

7	a)	Illustrate the optical properties of ceramic materials.	**6**
	b)	Discuss the importance of biomaterials, brief the importance of self-assembly in biomaterials aspects.	**6**
	c)	Explain the preparation of PZT as a ceramic material and discuss its importance.	**8**

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