U.S.N.										

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

Autonomous Institute Affiliated to VTU

January 2024 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: ES – Cluster Elective **Duration: 3 hrs.**
Course Code: 19EE7CE2EM **Max Marks: 100**
Course: Electrical and Electronics Engineering Materials

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

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			CO	PO	Marks
		UNIT - I			
1	a)	Illustrate with examples the Classification of Engineering Materials	*CO1*	*PO1*	**10**
	b)	Draw the Bravais Lattice for i) Orthorhombic ii) Tetragonal structure of crystal. Give example of such a crystal	*CO1*	*PO1*	**10**
		UNIT - II			
2	a)	Illustrate the concept of Bond Energy, Bond Type and Bond Length with examples	*CO2*	*PO1*	**10**
	b)	Enumerate the variations in the bond strength, melting point, thermal expansion and density of the metals of the first transition series with the help of a graph.	*CO2*	*PO1*	**10**
		OR			
3	a)	Define Ionization Potential, Electron Affinity and Electronegativity	*CO2*	*PO1*	**08**
	b)	Differentiate between Ionic bonding, Covalent bonding and Metallic bonding	*CO2*	*PO1*	**12**
		UNIT - III			
4	a)	With reasons justify that the following are best suited either as conductors or resistors – i) Copper ii) Kanthal wire iii) Graphite iv) Molybdenum and tantalum v) Tungsten	*CO2*	*PO1*	**10**
	b)	Explain the concept of conduction by free electrons and derive the expression for the conductivity (σ)	*CO2*	*PO1*	**10**
		UNIT - IV			
5	a)	Illustrate the Fermi level in an intrinsic semiconductor and show the energy gap.	*CO3*	*PO2*	**08**
	b)	In fabrication process, explain the concept of Czochralski (CZ) process of single crystal growth with a neat diagram.	*CO3*	*PO2*	**12**

			UNIT - V			
	6	a)	Illustrate with the help of magnetic lines of forces, Classification of magnetic materials	*CO3*	*PO 2*	**10**
		b)	Explain magnetic measurements using direct current method.	*CO4*	*PO3*	**10**
			OR			
	7	a)	Differentiate Soft magnetic and hard magnetic materials. Give examples	*CO3*	*PO2*	**10**
		b)	Illustrate the process of Conductivity measurements using Kelvin's Double Bridge	*CO4*	*PO3*	**10**

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