Code No: **R201115** **R20** **SET - 1**

I B. Tech I Semester Regular/Supplementary Examinations, February - 2023
APPLIED CHEMISTRY

(Common to ECE, EIE, ECT, CSE-AI&ML, CSE-AI, CSE-DS, CSE-AI&DS, AI&DS,AIML,CSD)

Time: 3 hours Max. Marks: 70

Answer any FIVE Questions ONE Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1.	a)	What are polymer composites? Write the advantages of polymer composites.	[7M]
	b)	Explain about suspension polymerization with examples.	[7M]
		(OR)	
2.	a)	Is there any use of plastic in electronic gadgets industry? Explain with examples.	[7M]
	b)	What are biopolymers? Give some examples, write their properties and applications.	[7M]
		UNIT-II	
3.	a)	Distinguish between chemical corrosion and electrochemical corrosion.	[7M]
	b)	Explain the working principle of methanol-oxygen fuel cell with reactions.	[7M]
		(OR)	
4.	a)	Explain impressed cathodic current techniques for the preventions of corrosion with a suitable diagram.	[7M]
	b)	What is electrochemical series? Give its applications.	[7M]
		UNIT-III	
5.	a)	What are magnetic materials? Classify the various magnetic materials with examples.	[7M]
	b)	Write about Brunauer Emmet Teller (BET) and scanning electron microscopy (SEM) characterization techniques.	[7M]
		(OR)	
6.	a)	Explain the conduction phenomenon in stoichiometric and chalcogen semiconductors.	[7M]
	b)	What are liquid crystals? Briefly explain the classification of liquid crystals.	[7M]
		UNIT-IV	
7.	a)	Explain the following with respect to UV-visible spectroscopy. (i) Bathochromic or red shift; (ii) Hypsochromic or blue shift (iii) Hypochromic shift; (iv) Hyperchromic shift	[7M]
	b)	What is geothermal energy? How is it used to generate electrical power? Discuss its merits and limitations.	[7M]
		(OR)	
8.	a)	Write the three applications of UV and IR spectroscopy.	[7M]
	b)	What is hydro energy? Explain the principle of generating electricity from hydro energy. What are some benefits and limitations of hydropower	[7M]
		UNIT-V	
9.	a)	What is molecular docking? Write its applications?	[7M]
	b)	Briefly discuss about an autonomous light powered molecular motor.	[7M]
		(OR)	
10.	a)	What are rotaxanes and catenanes? Why are they used as artificial molecular machines? Explain.	[7M]
	b)	Briefly discuss about acid-base controlled molecular shuttle.	[7M]

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Code No: **R201115** **R20** **SET - 2**

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APPLIED CHEMISTRY

(Common to ECE, EIE, ECT, CSE-AI&ML, CSE-AI, CSE-DS, CSE-AI&DS, AI&DS,AIML,CSD)

Time: 3 hours Max. Marks: 70

Answer any FIVE Questions ONE Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1.	a)	Give the preparation, property, uses of PVC, Teflon and Polycarbonate.	[7M]
	b)	What is Buna-S, thiokol and polyurethanes? How are they prepared?	[7M]
		(OR)	
2.	a)	Explain about Emulsion polymerization with examples.	[7M]
	b)	What is meant by compounding of plastics? Describe the process of compression moulding with a neat sketch.	[7M]
		UNIT-II	
3.	a)	Explain Electrochemical corrosion with its types.	[7M]
	b)	Explain Phosphoric acid fuel cell with suitable diagram.	[7M]
		(OR)	
4.	a)	Differentiate Electroplating and Electro less plating and Explain electroless plating of Nickel.	[7M]
	b)	Explain zinc air battery with suitable diagram.	[7M]
		UNIT-III	
5.	a)	What are non-elemental semiconductors? Why are they termed as compound semiconductors? Explain.	[7M]
	b)	Write down the preparation, properties and uses of fullerene and graphene.	[7M]
		(OR)	
6.	a)	What are high temperature superconductors? Write the applications of superconductors.	[7M]
	b)	What are nanomaterials? Write down the sol-gel methods for the preparation of nanomaterials.	[7M]
		UNIT-IV	
7.	a)	Define infrared spectroscopy. Describe the various molecular vibrations responsible for IR absorption. Also explain the main requirement of a compound to be IR active.	[7M]
	b)	How can you obtain electricity from solar energy? Explain the principle and working of a photovoltaic cell.	[7M]
		(OR)	
8.	a)	Explain the following with respect to IR spectroscopy. (i) Fundamental vibrations and overtones (ii) Fermi resonance(iii) Fingerprint region	[7M]
	b)	Discuss about ocean thermal energy to generate electricity with neat diagram.	[7M]
		UNIT-V	
9.	a)	What is the principle of molecular modelling? Write the benefits of molecular modeling?	[7M]
	b)	Write about artificial and natural molecular machines.	[7M]
		(OR)	
10.	a)	Why is computational chemistry important? Write a short note on computational chemistry.	[7M]
	b)	What is the basic difference between catenane and rotaxane? What is linear motion in rotaxanes and how are rotaxanes created?	[7M]

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Code No: **R201115** **R20** **SET - 3**

I B. Tech I Semester Regular/Supplementary Examinations, February - 2023
APPLIED CHEMISTRY

(Common to ECE, EIE, ECT, CSE-AI&ML, CSE-AI, CSE-DS, CSE-AI&DS, AI&DS,AIML,CSD)

Time: 3 hours Max. Marks: 70

Answer any FIVE Questions ONE Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1.	a)	Define the functions of each ingredient in suspension polymerization with examples.	[7M]
	b)	What are conducting polymers? How does a non-conducting polymer become conducting? Explain various uses of conducting polymer.	[7M]

(OR)

2.	a)	What is fabrication of plastics? Explain injection moulding process with a neat diagram.	[7M]
	b)	Discuss about bio degradable polymers.	[7M]

UNIT-II

3.	a)	What is paint? What are the constituents and their functions in paint?	[7M]
	b)	What is galvanic corrosion? Discuss.	[7M]

(OR)

4.	a)	What are secondary cells? Explain the construction and working of Lithium ion battery. Write down the reactions taking place during charging and discharging of battery.	[7M]
	b)	What are metallic coatings? Describe the electroplating method with the help of neat diagram.	[7M]

UNIT-III

5.	a)	Write short notes on: (i) p-n junction diode as a rectifier(ii) p-n junction diode as a transistor	[7M]
	b)	Write short notes on: (i) Thermotropic liquid crystals(ii) Lyotropic liquid crystals	[7M]

(OR)

6.	a)	Explain in detail the various applications of liquid crystals.	[7M]
	b)	What is a superconductor? Write the properties of superconductors.	[7M]

UNIT-IV

7.	a)	Explain the Franck – Condon principle. Using suitable potential energy curves illustrate the Franck Condon principle in the vibronic spectrum of a diatomic molecule.	[7M]
	b)	How is wave energy harnessed? Discuss the technology used to obtain energy from waves and writeits limitations.	[7M]

(OR)

8.	a)	Explain the following (i) Allowed and forbidden transitions (ii) Chromophore (iii) Auxochrome	[7M]
	b)	Explain about the Ocean Thermal Energy Conversion.	[7M]

UNIT-V

9.	a)	What is autonomous light powered molecular motor? Explain.	[7M]
	b)	What is meant by molecular docking? How many types of molecular docking are there and write their uses.	[7M]

(OR)

10.	a)	What is molecular elevator? Explain.	[7M]
	b)	What are the main types of molecular motors? Explain	[7M]

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Code No: **R201115** **R20** **SET - 4**

I B. Tech I Semester Regular/Supplementary Examinations, February - 2023

APPLIED CHEMISTRY

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Time: 3 hours Max. Marks: 70

Answer any FIVE Questions ONE Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) what are biodegradable polymers give some examples and write their applications. [7M]
   b) What are the various mechanical properties of a polymer? Explain. [7M]

(OR)

2. a) What are composite materials? Discuss some important types of fibre-reinforced composites. [7M]
   b) What is Buna-S, thiokol and polyurethanes? Write their preparation, properties and uses? [7M]

UNIT-II

3. a) What is Chemical corrosion? Explain with its types. [7M]
   b) What are fuel cells? Explain the hydrogen-oxygen fuel cell and its advantages. [7M]

(OR)

4. a) What are reference electrodes? Describe the construction and working of a glass electrode. How can it be used for the determination of pH of a solution? [7M]
   b) What are the factors influencing corrosion? [7M]

UNIT-III

5. a) What are chalcogen semiconductors? Explain their application as light sensitive semiconductors. [7M]
   b) Write the preparation and applications of Fullerenes and Carbon nanotubes. [7M]

(OR)

6. a) Define Nanochemistry. Explain with the help of suitable examples how the properties of nanomaterials differ from those of the same materials in bulk size. [7M]
   b) What is a superconductor? Explain the difference between type I and type II superconductors. [7M]

UNIT-IV

7. a) Why is UV-visible spectroscopy called as electronic spectroscopy? What is the absorption range? Explain the Beer–Lambert's law. [7M]
   b) How is wind energy used for the generation of electric power? Discuss the merits and limitations of wind energy. [7M]

(OR)

8. a) What is an Magnetic Resonance Imaging (MRI) briefly explain how it works? [7M]
   b) What are tides? Explain its working to generate electricity from tides and limitations. [7M]

UNIT-V

9. a) Explain the characteristics of molecular motors. [7M]
   b) what are molecular machines? Explain with examples. [7M]

(OR)

10. a) What is an acid-base controlled molecular shuttle? Explain. [7M]
    b) What is the purpose of molecular motors? How does a molecular motor work? Explain. [7M]

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