AR18

CODE: 18BST108 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I / I B.Tech II Semester Supplementary Examinations, October-2021

CHEMISTRY

(Common to All Branches)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain about SP^3 and SP^3d hybridization with examples	6M
	b)	Write about Molecular orbital theory. Explain MO diagram of O2	6M
		(OR)	
2.	a)	Write a note on i) Ionization energy ii) Electron Negativity	6M
	b)	Explain about Valency shell electron pair repulsion theory	6M

UNIT-II

3.	a)	Explain about Chromophore and Auxochrome	6M
	b)	Explain Fluorescence and Phosphorescence by using JOB's Diagram	6M
		(OR)	
4.	a)	Explain the terms i) Hypsochromic shift ii) Hyperchromic shift.	6M
	b)	What is Spectroscopy? Write the IR values for -Carbonyl,-alcohol,-nitryle,-amino groups	6M

UNIT-III

5.	a)	Write about the construction and working of Calomel Electrode. Give a neat sketch.	6M
	b)	What is meant by Reference electrode? Explain principle and working of Primary Reference electrode.	6M
		(OR)	
6.	a)	Discuss Electrochemical theory of corrosion.	6M
	b)	Explain the factors that affect the rate of corrosion.	6M

UNIT-IV

7.	a)	Explain SN^2 mechanism with examples.	6M
	b)	Explain Claisen rearrangement with example	6M
		(OR)	
8.	a)	Explain Addition and Condensation polymerizations with suitable examples.	6M
	b)	Write a note on Zeiglar Natta catalysis.	6M

UNIT-V

9.	a)	Explain the construction and working of Photo voltaic cell.	6M
	b)	Explain the principles of Green Chemistry.	6M
		(OR)	
10.	a)	Write a note on concentrated solar power plants	6M
	b)	Give the Applications of Solar energy.	6M

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AR16

CODE: 16BS1004 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I / I B.Tech II Semester Supplementary Examinations, October-2021

ENGINEERING CHEMISTRY

(Common to All Branches)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place.

UNIT-I

1.	a)	Write a note on thermosetting plastics and give two examples.	4M
	b)	Explain the following fabrication techniques with a neat sketch i)Compression moulding ii) Extrusion moulding	10M

(OR)

2.	a)	Give the chemical composition and raw materials of Portland cement.	8M
	b)	Write a note on setting and hardening of Portland cement with necessary chemical equations.	6M

UNIT-II

3.	a)	Explain briefly the estimation of total hardness of water by EDTA method.	8M
	b)	How is natural water is sterilized by using chlorine and ozone?	6M

(OR)

4.	a)	Discuss the treatment of water for domestic purpose.	8M
	b)	Describe the hot lime soda process of softening of boiler feed water with a neat diagram.	6M

UNIT-III

5.	a)	What is cathodic protection? Explain impressed current method of cathodic protection.	9M
	b)	Write a short on Galvanic series and explain how it is advantageous over electrochemical series in predicting the relative corrosion tendencies.	5M

(OR)

6. a) Explain galvanic corrosion with suitable examples. 4M
   b) Write a note on sacrificial anodic protection method. 5M
   c) Explain chemical or dry corrosion by direct chemical attack theory. 5M

UNIT-IV

7. a) Discuss the refining of crude oil or petroleum by giving the composition, boiling range and uses of various fractions obtained during refining. 8M
   b) Explain Bergius method for synthesis of petrol with a neat diagram. 6M

(OR)

8. a) Explain the mechanism of thin film lubrication. 6M
   b) Explain the following properties of a lubricant. 8M
   i)Flash point & Fire point ii) Pour point & Cloud point

UNIT-V

9. a) What is a reference electrode? Explain the construction and working of Standard Hydrogen Electrode. 7M
   b) What is single electrode potential? what is Nernst equation? 4M
   c) What is Faraday's first law of electrolysis? 3M

(OR)

10. a) Discuss the Green house concepts. 4M
    b) Write a short note on the following 10M
    i)Solar tower ii) Photo voltaic cell

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AR13

Code: 13BS1005 **SET-I**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I / I B.Tech II Semester Supplementary Examinations, October-2021
ENGINEERING CHEMISTRY
(Common to All Branches)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) List out the constituents on OPC.
   b) Why mono functional monomers do not exist?
   c) Express 11.1 ppm of $CaCl_2$ in equivalents of $CaCO_3$, degree French.
   d) What is disinfectioning of water?
   e) Name any four factors that influence rate of corrosion.
   f) What is Galvanic series?
   g) Define flash and fire point of lubricants.
   h) Give the catalyst used in Bergius process.
   i) Write any two principles of green chemistry
   j) Outline any two applications of silver nanoparticles

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a Distinguish between thermosetting and thermoplastic plastics. 6 M
   b Discuss in detail about compression and injection moulding of plastics 6 M

(OR)

3. a Describe the manufacturing of OPC with a neat sketch. 8M
   b With suitable chemical reactions explain hardening of cement 4M

UNIT-II

4. a Explain the determination of total hardness of water by EDTA method 6M
   b A 20mL sample of water is titrated against 0.01M EDTA solution and the titer value is 12.3 mL. The sample of water is boiled and cooled. 20mL of this water titrated against same EDTA solution and the titer value is 3.8 mL. Calculate total, temporary and permanent hardness. 6M

(OR)

5.	a	Briefly explain the methods of treatment of water for domestic purposes.	8M
	b	Calculate the permanent hardness from the following data. Calcium bicarbonate= 10.0ppm; calcium sulphate = 13.6 ppm; magnesium chloride= 9.5 ppm; magnesium bicarbonate = 12.0ppm.	4M

UNIT-III

6.	a	With appropriate chemical reactions explain the mechanism of electrochemical chemical corrosion.	8M
	b	How nature of metal oxide layer influences rate of corrosion.	4M

(OR)

7.	a	Discuss in detail about sacrificial anodic protection with a neat sketch.	6M
	b	Explain how proper design of machine influences rate of corrosion.	6M

UNIT-IV

8.	a	Discuss the following cetane number and octane number	6M
	b	With a neat diagram explain fractional distillation of crude oil	6M

(OR)

9.	a	Discuss the mechanism of thick film and thin film lubrication	6M
	b	Describe in detail about any three properties of lubricants.	6M

UNIT-V

10.	a	Write the engineering applications of green chemistry	4M
	b	Discuss in detail about solar power plant and its working	8M

(OR)

11.	a	Discuss the engineering and biomedical applications of nanomaterials	6M
	b	Explain the synthesis of CNT's	6M

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