AR16

CODE: 16BS1004 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, March-2017

ENGINEERING CHEMISTRY

(Common to CE, EEE & ME Branches)

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

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered at one place only

UNIT-I

1.	a)	Write the mechanism of additional polymerization	6M
	b)	What is meant by compounding of plastics? What are the different constituents of compounding? Write their uses	8M
		(OR)	
2.	a)	Explain the manufacture of cement	6M
	b)	Explain about setting and hardening of cement	8M

UNIT-II

3.	a)	What are the constituents that cause temporary permanent hardness? How do you estimate hardness by EDTA method.	6M
	b)	Explain the following methods used in treatment of drinking water i) sedimentation ii) filtration	8M
		(OR)	
4.	a)	Explain any one Desalination method with neat diagram	8M
	b)	Explain Lime-soda process for removal of hardness in water.	6M

UNIT-III

5.	a)	Write any two causes and effects of corrosion. Explain about chemical corrosion	8M
	b)	Write a short note on pitting and stress corrosion	6M
		(OR)	
6.	a)	How the nature of environment influence the rate of corrosion	6M
	b)	Explain the control of corrosion by cathodic protection	8M

UNIT-IV

7.	a)	Explain Fischer-Tropschs method for synthesis of petrol with neat diagram	8M
	b)	Explain about thin film and thick film lubrication	6M
		(OR)	
8.	a)	Explain Bergius method for synthesis of petrol with neat diagram	8M
	b)	Explain about i)flash point and fire point ii) cloud point and pour point	6M

UNIT-V

9.	a)	What is single electrode potential? Derive Nernst equation	8M
	b)	Explain the concentrated solar power plant by using solar power tower with neat diagram	6M
		(OR)	
10.	a)	Explain about harnessing of solar energy	6M
	b)	Explain in detail about electrochemical series and calomel electrode	8M

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CODE: 16BS1003 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, March-2017

ENGINEERING PHYSICS

(Common to ECE, CSE & IT Branches)

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

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT-I

1. a) What is interference of light? State the fundamental conditions for the production of interference fringes. 4M

   b) With necessary theory describe Newton's rings experiment to determine wave length of the given source of light? 10M

(OR)

2. a) State the differences between interference and diffraction. 4M

   b) Discuss the Fraunhofer diffraction at a single slit. Explain how it can be used to determine the slit width. 10M

UNIT-II

3. a) Discuss the phenomenon of population inversion. How do you achieve it? 4M

   b) Discuss any two applications of Lasers. 2M

   c) Describe the construction and working of Ruby laser 8M

(OR)

4. a) Draw the block diagram of a fiber optic Communication system and explain the function of each block. 7M

   b) Discuss about the modes of propagation in a optical fibers. 7M

UNIT-III

5. a) State Heisenberg's Uncertainty Principle. Discuss its Significance. 6M
   b) Explain de-Broglie hypothesis. 4M
   c) Explain the physical significance of wave function. 4M

(OR)

6. a) Derive time independent Schrodinger's wave equation for a free particle and discuss. 10M
   b) Calculate the de Broglie wavelength of an electron which has been accelerated from rest on application of potential of 400 volts. 4M

UNIT-IV

7. a) Define magnetic permeability and magnetic susceptibility? 4M
   b) What is the origin of magnetic moment in magnetic materials? Explain it. 4M
   c) Obtain an Expression for the Bohr Magnetron 6M

(OR)

8. a) What are the different types of magnetic materials? Mention their properties with examples. 10M
   b) Distinguish between hard and soft magnetic materials. 4M

UNIT-V

9. Discuss in detail the three types polarizations and their dependence on temperature. 14M

(OR)

10. a) What are dielectric materials? Explain their importance. 4M
    b) Explain in detail, electronic and ionic polarizations 6M
    c) What is Ferroelectric Hysteresis 4M

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AR13

CODE: 13BS1004 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March-2017
ENGINEERING PHYSICS
(Common to CE, ME, CSE & IT)

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

PART-A

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

1. a) Where is the air film present in Newton's Rings?
   b) What is the nature of Wave Front in case of Fresnel's Diffraction?
   c) Define Population Inversion
   d) What is the principle of Optical Fiber?
   e) Define Atomic Radius
   f) Sketch the plane (101)
   g) What is the value of Bohr Magneton?
   h) What is Polarizability?
   i) Who proposed Classical Free Electron Theory?
   j) Give the expression for energy value for a particle in a one dimensional potential box.

PART-B

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

UNIT-I

2. a. Describe the Interference in thin film by reflection. **8M**
   b. A parallel beam of light of wavelength $6000A^0$ is incident on a thin glass plate of refractive index 1.5 such that the angle of refraction is 50^0. Find the least thickness of the glass plate which appear dark by reflection. **4M**

(OR)

3. a. Distinguish between Interference and Diffraction **4M**
   b. Obtain the condition for primary and secondary maxima in Fraunhofer diffraction due to single slit. **8M**

UNIT-II

4. a. Explain the basic components of Laser. **4M**
   b. With the help of suitable diagrams describe the construction and working of He-Ne Laser. **8M**

(OR)

5. a. Describe the construction of an Optical Fiber **4M**
   b. What is Acceptance Angle? Derive the expression for Acceptance angle for an optical fiber. **8M**

UNIT-III

6. a. Explain the terms (i) Co-ordination number (ii) Packing Fraction **4M**
   b. Describe the seven Crystal systems with neat diagrams. **8M**

(OR)

7. a. Derive the expression for Interplanar spacing between parallel planes **6M**
   b. State and explain Bragg's law of X-ray Diffraction **6M**

UNIT-IV

8. a. Distinguish between dia, para and ferromagnetic materials **4M**
   b. Explain the Hysteresis curve in a ferromagnetic material **8M**

(OR)

9. a. Explain the terms (i) Polarization Vector (ii) Displacement Vector **4M**
   b. What is orientation polarization? Derive an expression for orientational polarizability. How does it depend on temperature? **8M**

UNIT-V

10. a. Derive the expression for electrical conductivity on the basis of Classical Free Electron theory. **6M**
    b. State the drawbacks of classical free electron theory **6M**

(OR)

11. a. Explain the de-Broglie hypothesis **4M**
    b. Show that energies of a particle in a potential box are quantized **8M**

AR13

CODE: 13BS1005 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March-2017
ENGINEERING CHEMISTRY
(Common to EEE & ECE)

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

PART-A

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

1. (a) What is degree of polymerization?
   (b) Mention the raw materials of cement.
   (c) What is chlorination?
   (d) What is meant by galvanic corrosion?
   (e) What is desalination?
   (f) What is corrosion inhibitor? Mention two types of inhibitors.
   (g) How the crude oil is classified?
   (h) Write methods employed in production of synthetic petrol.
   (i) Mention the electrical properties of nano materials.
   (j) Write any two utilities of Solar energy.

PART-B

Answer one question from each unit [5X12M=60M]

UNIT-I

2. a) Explain preparation, properties and uses of Nylon.
   b) Write a brief note on classification of cement. [6M+6M=12M]

(OR)

3. a) What is addition and condensation polymerization. Give any two examples of each.
   b) Write the chemical composition, specifications and standards of Port land cement. [6M+6M=12M]

UNIT-II

4. a) Explain the methods of treatment of water for domestic purpose.
   b) Explain Zeolite method for softening the water. [6M+6M=12M]

(OR)

5. a) What is meant by sterilization? Explain Break point Chlorination.
   b) Explain Ion exchange method for softening the water. [6M+6M=12M]

UNIT-III

6. a) Define corrosion. Explain dry corrosion with mechanism.
   b) Explain concentration cell corrosion of metal with diagram. [6M+6M=12M]

(OR)

7. a) Write detailed notes on Galvanic corrosion. [6M+6M=12M]
   b) Explain Impressed current cathodic protection to control metal corrosion.

UNIT-IV

8. a) Give an account of Octane number and Cetane number . Write the importance.
   b) Explain classification of lubricants with examples. [6M+6M=12M]

(OR)

9. a) Explain manufacture of synthetic petrol by Bergius method.
   b) Describe fire point and flash point of Lubricants. [6M+6M=12M]

UNIT-V

10. a) Mention any four principle of green chemistry.
    b) Explain working of Solar power plants.
    c) Write short notes on Silver nano particles. [4M+4M+4M=12M]

(OR)

11. a) Discuss the properties of nano particles.
    b) Explain the significance of Green chemistry synthesis in Engineering applications.
    b) Explain green house concept. [4M+4M+4M=12M]