AR16

CODE: 16BS1004 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, December, 2016

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

UNIT-I

1.	a)	Discuss various methods involved in moulding of plastics into articles?	**8M**
	b)	Describe the wet process of manufacture of cement by the rotary kiln method?	**6M**
		(OR)	
2.	a)	Write preparation, properties and uses of PVC and Bakelite?	**8M**
	b)	What are the constituents of cement? Discuss the role of each constituent?	**6M**

UNIT-II

3.	a)	Discuss Municipal water treatment for Drinking water?	**7M**
	b)	Three samples of water are collected from Seethapuram (SP), Ayodhyapuram(AP) and Srirangam (SG). 100 mL of the water sample collected at SP requires 34 mL of 0.01 M EDTA solution on titration. 100 mL of the water sample collected at AP required 48 ml of 0.01 M EDTA solution on titration. 100 mL of the water sample collected at SG requires 15 mL of 0.01 M EDTA solution on titration. Discuss the results ?	**7M**
		(OR)	
4.	a)	Write the chemical reactions involved in Estimation of water Hardness by EDTA method?	**4M**
	b)	What is desalination? Describe various methods available for desalination and compare them critically?	**10M**

UNIT-III

5.	a)	A student, in replying to an examination question, writes: 'Corrosion of metal is due to electrical currents of electrochemical origin, Stop current stop corrosion. Comment on the correctness or otherwise of this statement on the basis of your knowledge of electrochemistry.	**9M**
	b)	Explain what type of corrosion occurs when Screw & washer are made of different metals?	**5M**

(OR)

6. a) Illustrate with the aid of label diagrams that show how a (i) Magnesium Bar and (ii) D.C Electrical power supply could be used to prevent or at least decrease the extent of corrosion of a steel underground pipeline used for carrying gases? **10M**

   b) When a coating is plated onto a metal, two different metals are in contact with each other. Why doesn't galvanic corrosion occur at this interface? **4M**

UNIT-IV

7. a) Explain fractional distillation of refining of petroleum **7M**

   b) Write a brief note on extreme pressure lubrication **7M**

(OR)

8. a) Define knocking. Explain octane number and cetane number. **7M**

   b) What are the characteristic features of synthetic lubricants? **7M**

UNIT-V

9. a) Electrode potentials are specified as potentials relative to a standard hydrogen reference electrode. Why is the electrode potential specified in this manner rather than absolute values being given? Also explain the measurement of Electro potentials values of any two electrodes with neat diagrams and necessary cell notations. **10M**

   b) Every year, 5.6 × 1021 kJ of energy comes to Earth from the Sun. Why can't this energy be used to meet all of our energy needs? **4M**

(OR)

10. a) Describe the construction and working of **10M**
    i) hydrogen electrode ii) calomel electrode.

    b) Write a short note on green house effect **4M**

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AR16

CODE: 16BS1003 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, December, 2016

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 at one place

UNIT-I

1.	a)	Describe how you would use Newton's Rings to determine the wavelength of a monochromatic radiation and derive the relevant formula?	**10M**
	b)	A parallel beam of light ($\lambda = 5890 \times 10^{-10}$m) is incident on a thin glass plate ($\mu = 1.5$) such that the angle of refraction into the plate is 60^{o}. Calculate the smallest thickness of plate which would appear dark by reflection.	**4M**

(OR)

2.	a)	Distinguish between interference and diffraction?	**4M**
	b)	Explain the distribution of intensity from Franhoffer diffraction?	**10M**

UNIT-II

3.	a)	What are the basic characteristics of laser	**4M**
	b)	What are Einstein's coefficients?	**4M**
	c)	Explain the construction and working of Ruby Laser?	**6M**

(OR)

4.	**a)**	What is the principle behind the working of an optical fiber	**4M**
	b)	Obtain the condition for light wave propagation in an optical fiber?	**10M**

UNIT-III

5. a) Define de Broglie hypothesis and obtain the expression for de Broglie wavelength? **6M**
   b) List out the properties of matter waves? **4M**
   c) Calculate the wavelength associated with an electron raised to a potential 1600V **4M**

(OR)

6. a) Derive the time independent Schrodinger's equation for a free particle. **10M**
   b) Show that the wavelength of an electron accelerated by a potential difference V volts is $\frac{12.27}{\sqrt{V}}$ **4M**

UNIT-IV

7. a) What are ferrites? Explain the magnetic properties of ferrites and mention industrial applications? **4M**
   b) Classify magnetic materials on the basis of susceptibility? **6M**
   c) A magnetic material has a magnetization of 3300 ampere/m and flux density of 0.0044 wb/m^2 calculate the relative permeability of the medium. **4M**

(OR)

8. a) Define magnetic susceptibility, magnetic field strength and intensity of magnetization? **4M**
   b) What is the basis of magnetism explain? Draw the Hysteresis curve? **10M**

UNIT-V

9. a) What is piezoelectricity? **4M**
   b) What are the various insulating materials explain **6M**
   c) The dielectric constant of He gas at NTP is 1.0000684. calculate the electronic polarizability of He atoms if the gas contains 2.7 x10^{25} atoms per m^3 **4M**

(OR)

10. a) Obtain an expression for ionic polarizability? **8M**
    b) Define dielectric loss and dielectric breakdown? **6M**

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