Code No: 09A1BS03 **R09** **Set No. 2**

I B.Tech Examinations,June 2011
ENGINEERING CHEMISTRY
Common to CE, ME, CHEM, BME, IT, MECT, MEP, AE, BT, AME, AIE, ICE, E.COMP.E, MMT, ETM, EIE, CSE, ECE, EEE
Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. What are the properties of a good lubricant? What is its significance? [15]
2. (a) What is Gibbs phase rule, its significance and limitations?
   (b) Explain with suitable examples the terms involved in Gibb's phase rule. [8+7]
3. (a) What is a single electrode potential? Describe a method for its determination.
   (b) Write the cell reactions of a Daniel cell.
   (c) Write a brief account of concentration cells. [7+4+4]
4. Write a detailed account on the following:
   (a) Origin of charge on colloids.
   (b) Stability of colloids. [8+7]
5. (a) Describe the different types of corrosion and discuss the factors that affect corrosion.
   (b) What is cathodic protection?
   (c) Write a note on electro plating. [9+2+4]
6. Describe the preparation, properties and uses of the following :-
   (a) PVC
   (b) Terylene
   (c) Polystyrene. [5+5+5]
7. (a) What is the principle involved in internal treatment of boiler few water?
   (b) One litre of water from an under ground reservoir in Tirupathi Town in Andhra Pradesh showed the following analysis for its contents: $Mg(HCOO_3)_2$ = 42 mg; $Ca(HCO_3)_2$ = 146mg; CaC l_2 = 71mg; NaOH = 40mg; $MgSO_4$ = 48 mg; organic impurities = 100 mg; Calculate temporary, permanent and total hardness of this sample of 10,000 litres of water. [8+7]
8. Give an account of the analysis of flue gases by Orsat apparatus and its significance. [15]

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Code No: 09A1BS03 **R09** **Set No. 4**

I B.Tech Examinations,June 2011
ENGINEERING CHEMISTRY
Common to CE, ME, CHEM, BME, IT, MECT, MEP, AE, BT, AME, AIE, ICE, E.COMP.E, MMT, ETM, EIE, CSE, ECE, EEE
Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is an electro chemical cell? Explain the construction and reactions of any electro chemical cell.
   (b) Explain how Nernst equation is useful in calculating the electrode potential? [9+6]
2. (a) State and explain BET equation for multilayer adsorption.
   (b) How is the surface area of an adsorbent is determined with the help of BET equation? [7+8]
3. What are phase diagrams? How are they drawn? What is the significance of phase diagrams? [15]
4. (a) Define metallic corrosion? Explain the mechanism of electrochemical corrosion by hydrogen evolution and oxygen absorption.
   (b) Explain differential aeration corrosion with a suitable example. [9+6]
5. (a) What is PVC? How is it prepared? Explain the differences between plasticized PVC and unplasticized PVC.
   (b) Write a note on vulcanization of rubber. [8+7]
6. Write shortnotes on the following.
   (a) Knocking
   (b) Natural gas.
   (c) Refining of petroleum. [6+4+5]
7. (a) What are thermal insulators? How do they differ from electrical insulators?
   (b) Give an account of the organic and inorganic thermal insulators with suitable examples and applications. [7+8]
8. Write short notes on following:
   (a) Calgon treatment
   (b) Phosphate conditioning
   (c) Ion-exchange process. [5+5+5]

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Code No: 09A1BS03 **R09** **Set No. 1**

I B.Tech Examinations,June 2011
ENGINEERING CHEMISTRY
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Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Discuss the phenomenon and applications of
   i. metal cladding and
   ii. electroplating.
   (b) What is the influence of nature of environment on corrosion. [8+7]
2. Justify the following statements with proper illustrations
   (a) At triple point the system has zero degree of freedom
   (b) The fusion curve of ice has negative slope where as sublimation curve has positive slope. [7+8]
3. (a) Explain the terms homopolymer and co-polymer with suitable examples.
   (b) Write notes on
   i. Guna-S rubber
   ii. polyurethane rubber. [4+5+6]
4. (a) How is coal graded? Explain your answer with the composition, calorific values and applications of the different grades of coal.
   (b) Give an account of the advantages and disadvantages of coal over gaseous fuels. [8+7]
5. How are the following properties influence the stability of refractories?
   (a) Chemical innertness.
   (b) Refractoriness under load.
   (c) Refractoriness.
   (d) Dimentional stability. [15]
6. Write an account of the following
   (a) Micelles
   (b) Dialysis. [8+7]
7. (a) Explain the principle of the hydrogen-oxygen fuel cells.
   (b) Differentiate between electrolytic cells and concentration cells with suitable examples. [8+7]

8. (a) What is desalination?
   (b) Describe the different methods used for desalination of water. [2+13]

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Code No: 09A1BS03 **R09** **Set No. 3**

I B.Tech Examinations,June 2011
ENGINEERING CHEMISTRY
Common to CE, ME, CHEM, BME, IT, MECT, MEP, AE, BT, AME, AIE, ICE, E.COMP.E, MMT, ETM, EIE, CSE, ECE, EEE
Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Define the terms:
   i. Specific conductance
   ii. Equivalent conductance of an electrolyte. How do they vary on dilution?
   (b) Describe how the equivalent conductance of a 0.01M solution of $NaNO_3$ is determined experimentally. [7+8]
2. Write short notes on the following.
   (a) Functionality.
   (b) Free-radical chain polymerization.
   (c) Ionic polymerization. [4+5+6]
3. (a) Explain the principle involved in wet corrosion.
   (b) What are organic paints? Explain their constituents and functions. [8+7]
4. (a) Give an account of the classification of the fuels with suitable examples.
   (b) Define Octane number of gasoline. What is its significance and how is it measured? Why ethylene dibromide is added when TEL is used as an antiknock reagent? [6+9]
5. Deduce the expression F+P=C+2 and explain the terms involved with suitable illustrations and the significance of the terms involved. [15]
6. (a) What is caustic embrittlement?
   (b) Explain the priming and foaming in boilers.
   (c) Write a note on phosphate and carbonate conditioning of water. [4+6+5]
7. Write an account on the following
   (a) Electro phoresis
   (b) BET Adsorption isotherm. [7+8]
8. Give an account on the engineering applications of Insulators and superconductors. [15]

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