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

I B.Tech Examinations,December 2010
ENGINEERING CHEMISTRY
Common to CE, ME, CHEM, BME, IT, MECT, MEP, AE, BT, AME, 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) Outline the electrochemical theory of corrosion and explain the mechanism of rust formation in acidic and neutral medium.
   (b) Write a brief account of cathodic protection. [9+6]
2. (a) Write a short note an electro chemical series?
   (b) Explain the functioning of a Galvanic cell? [7+8]
3. (a) Explain the terms chain and step-growth polymerizations with appropriate examples.
   (b) Describe the preparation, properties and uses of
      i. polythene
      ii. nylon (6,6) [5+10]
4. Write a detailed account on the following:
   (a) Origin of charge on colloids.
   (b) Stability of colloids. [8+7]
5. (a) What do you understand by the priming and foaming problems in boilers?
   (b) Differentiate between scale and sludge formation in boliers. What are their disadvantages? [8+7]
6. How are the following classified?
   (a) Refractories
   (b) Insulators.
   (c) Lubricants.
   (d) Superconductors. [15]
7. What is meant by heat treatment of steel? Explain the different heat treatment processes carried out with relevant applications. [15]
8. Distinguish between the following:
   (a) Gross calorific value from net calorific value.
   (b) Thermal cracking from catalytic cracking.
   (c) Gaseous fuels from liquid fuels. [6+5+4]

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

I B.Tech Examinations,December 2010
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Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. Give an account of the following:
   (a) Criteria of a good lubricant.
   (b) Viscosity.
   (c) Fluid film lubrication. [5+5+5]
2. (a) Explain the differences between thermoplastics and thermoset plastics.
   (b) Outline the preparation, properties and uses of polyester. [8+7]
3. State and explain Gibbs phase rule. Discuss its significance, applications and limitation by mentioning proper illustrations. [15]
4. (a) Write the structure of EDTA and the complex formed between Mg^{+2} and EDTA.
   (b) What are boiler-troubles? Explain the scale and sludge formation in boilers. [4+11]
5. Give an account of the analytical applications of colloids. [15]
6. (a) Define the terms specific, equivalent and molar conductivities. How do they vary with dilution.
   (b) Calculate the cell constant of a cell having a solution of concentration N/30 gm. equiv/litre of an electrolyte which showed the equivalent conductance of 120 Mhos cm^2 gm $equiv^{-1}$. [8+7]
7. (a) Discuss the influence of following factors on corrosion:-
      i. Over voltage
      ii. Nature of the metal
      iii. Nature of environment.
   (b) Explain the nature and role of constituents of organic paints. [9+6]
8. (a) ExplainHCV and LCV of fuels and how do they differ? What is their significance?
   (b) A sample of coal contains the following composition Carbon = 84%, Hydrogen = 12%, Oxygen = 2%, Sulphur = 1% and the remainder being ash. Calculate the gross and net calorific values of the fuel. [8+7]

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

I B.Tech Examinations,December 2010
ENGINEERING CHEMISTRY
Common to CE, ME, CHEM, BME, IT, MECT, MEP, AE, BT, AME, 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) Distinguish Electrochemical cells from Electrolytic cells with suitable illustrations.
   (b) What is electrode potential? How is it determined by using Calomel Standard Electrode. [7+8]
2. What is cracking? Explain the different types of cracking processes along with their advantages. [15]
3. With the help of neat diagrams explain the following criteria of lubricants.
   (a) Viscosity
   (b) Flash and fire point.
   (c) Carbon residue. [4+7+4]
4. (a) What is natural rubber? How is it processed?
   (b) How is crude rubber obtained from latex?
   (c) Write a note on preparation, properties and uses of buna-s-rubber? [5+5+5]
5. (a) Explain sacrificial anodic protection method of controlling corrosion.
   (b) Write a note on anodic protection and the nature of corrosion product. [6+9]
6. Explain the technical applications of colloids with suitable illustrations. [15]
7. (a) What are the different allotropes of iron, their transformations and lattice patterns?
   (b) Explain the various micriconstituents of iron-carbon alloys which contain the allotropic forms of iron. [7+8]
8. (a) What are scales? How are they formed in boilers? What are their disadvantages?
   (b) What are the prevention methods for scale formation in boilers. [6+9]

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

I B.Tech Examinations,December 2010
ENGINEERING CHEMISTRY
Common to CE, ME, CHEM, BME, IT, MECT, MEP, AE, BT, AME, 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 cell constant? How is it determined?
   (b) Describe a method for the determination of pH of a solution using Standard Calomel electrode. [7+8]
2. Explain the following with suitable illustrations.
   (a) Sweetening of petrol
   (b) Bergeous method of synthesis of petrol. [7+8]
3. Explain the setting and hardening of cement with relevant chemical reactions involved. [15]
4. Give proper explanations for the following statements
   (a) The fusion curve of ice has a negative slope whereas the sublimation curve has positive slope in the phase diagram
   (b) In lead-silver system, isobaric phase diagrams are studied. [7+8]
5. (a) Describe the zeolite process for softening of hard water.
   (b) Discuss the methods for disinfectaion of water. [8+7]
6. Explain the synthetic methods, properties and applications of the following elastomers:-
   (a) Buna-S rubber
   (b) Butyl rubber
   (c) Thiokol rubber. [5+5+5]
7. Write an account of the applications of nano technology to energy resources and food science. [15]
8. Write notes on the following:-
   (a) Hot dipping
   (b) Galvanizing
   (c) Tinning
   (d) Electroplating. [15]

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