Code No: 07A1BS07 **Set No. 1**

I B.Tech Supplimentary Examinations, Aug/Sep 2008
ENGINEERING CHEMISTRY
(Common to Mechanical Engineering, Mechatronics, Production Engineering and Automobile Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is meant by sterilization of water? Expalin how sterilization of water is carried out by using chlorine and ozone.
   (b) 0.28 g of $CaCO_3$ was dissolved in dil.HCl and the solution made up to one litre with distilled water. 100 mL of the above solution required 28 mL of EDTA solution for titration. 100 mL of the water sample required 33 mL of same EDTA solution for titration. After boiling 100 mL of this water, cooling, filtering and then titration required 10 mL of EDTA solution. Calculate the temporary and permanent hardness of water. [9+7]

2. Write short notes on :
   (a) Priming and Foaming
   (b) Phosphate conditioning
   (c) Caustic embrittlement. [5+6+5]

3. (a) Describe how electrochemical properties are used in protecting submerged metals from being corroded.
   (b) Explain the corrosion of iron by dilute mineral acids. [8+8]

4. (a) List the differences between anodic coating and cathodic coating.
   (b) How zinc coated on iron prevents corrosion?
   (c) Explain sand blasting method of surface preparation. [8+4+4]

5. (a) Explain the process of Extrusion moulding with a neat diagram?
   (b) How are the following polymers prepared? Mention their properties and uses.
      i. PVC
      ii. LDPE. [6+10]

6. (a) Define Refractories and what are the criteria of a good refractory?
   (b) Give the clasification of refractories with suitable examples. [6+10]

7. (a) Explain how the following act as lubricants:
      i. Graphite
      ii. Molybdenum disulphide.
   (b) How does pour-point depressant function as an additive in blended oils?[12+4]

8. (a) What is metallurgical coke? How it is superior than coal? Explain the manufacture of metallurgical coke by Otto Hoffman's by product coke oven method. List the various by products obtained.

   (b) Define octane number of gasoline. Why is ethylene di bromide added, when tetra ethyl lead is used as an antiknock? [10+6]

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Code No: 07A1BS07 **Set No. 2**

I B.Tech Supplimentary Examinations, Aug/Sep 2008
ENGINEERING CHEMISTRY
(Common to Mechanical Engineering, Mechatronics, Production Engineering and Automobile Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Write short notes on the following :
   (a) Break-point chlorination
   (b) Slow sand filtration
   (c) Impurities in water and their effects. [5+5+6]
2. Write short notes on :
   (a) Priming and Foaming
   (b) Phosphate conditioning
   (c) Caustic embrittlement. [5+6+5]
3. (a) What is electrochemical corrosion and how does it occur? Describe its mechanism.
   (b) What are corrosion inhibitors? Discuss anodic and cathodic inhibitors with suitable examples. [8+8]
4. (a) What are the functions of a thinner in a paint?
   (b) What are organic coatings? Mention the factors on which they depend ?
   (c) Mention the function of antiskining agent which is added to paint. Give examples. [6+6+4]
5. Write the structure of four addition polymers and 4 condensation polymers with their respective monomers. [16]
6. (a) What is pyrometric cone equivalent? How it is determined for a refractory? What is its significance?
   (b) Write a short note on:
      i. porosity
      ii. Thermal Conductivity
      iii. Dimensional Stability
      iv. strength. [8+8]
7. (a) Give the functions of lubricants.
   (b) Describe the mechanism of extreme pressure lubrication.

(c) How a viscous lubricant is converted into grease? [6+6+4]

8. (a) Explain how fuels are classified with suitable examples.

(b) Explain the significance of the following constituents present in coal.

i. Moisture
ii. Volatile matter
iii. Ash and
iv. Fixed carbon. [8+8]

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Code No: 07A1BS07 **Set No. 3**

I B.Tech Supplimentary Examinations, Aug/Sep 2008
ENGINEERING CHEMISTRY
(Common to Mechanical Engineering, Mechatronics, Production Engineering and Automobile Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Write a short note on the following:
   (a) Ozonization
   (b) Caustic embrittlement.
   (c) Zeolite softeners. [4+6+6]
2. Write short notes on :
   (a) Priming and Foaming
   (b) Phosphate conditioning
   (c) Caustic embrittlement. [5+6+5]
3. Write short note on the following:
   (a) Concentration cell corrosion with an examples
   (b) Conditions for wet corrosion to occur
   (c) Units of the rate of corrosion. [10+3+3]
4. Briefly discuss the various metallic coatings that prevent corrosion. [16]
5. (a) Explain the process of Extrusion moulding with a neat diagram?
   (b) How are the following polymers prepared? Mention their properties and uses.
      i. PVC
      ii. LDPE. [6+10]
6. (a) Define Refractories and what are the criteria of a good refractory?
   (b) Give the clasification of refractories with suitable examples. [6+10]
7. (a) Distinguish between hydrodynamic lubrication and boundary lubrication.
   (b) Distinguish between hydrodynamic lubrication and extreme pressure lubrication. [8+8]
8. (a) Explain Junker's gas calorimeter for the determination of calorific value of a gaseous fuel?
   (b) Distinguish between the followings.
      i. Gross and net calorific values

ii. Octane number and cetane number. [10+6]

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Code No: 07A1BS07 **Set No. 4**

I B.Tech Supplimentary Examinations, Aug/Sep 2008
ENGINEERING CHEMISTRY
(Common to Mechanical Engineering, Mechatronics, Production Engineering and Automobile Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Estimation of free chlorine in water samples.
   (b) Discuss the impurities in water and their effects. [9+7]
2. (a) Discuss the disadvantages of using hard water for various industries.
   (b) Explain the factors responsible for the corrosion of a boiler. Discuss the measures for its prevention. [8+8]
3. (a) What is electrochemical corrosion and how does it occur? Describe its mechanism.
   (b) What are corrosion inhibitors? Discuss anodic and cathodic inhibitors with suitable examples. [8+8]
4. (a) Write the conditions maintained for chromium plating.
   (b) What are the criteria for a good electrolyte chosen for electroplating?
   (c) Compare sheradizing and chromizing. [6+4+6]
5. (a) Explain the preparation, properties and uses of Bakelite.
   (b) Describe with a neat sketch, the process of compression moulding. [10+6]
6. (a) What are the causes leading to the failure of a refractory?
   (b) Describe
      i. Fire-Clay bricks
      ii. SiC bricks. [6+10]
7. Explain the various mechanisms of lubrication in detail. [16]
8. (a) Explain how fuels are classified with suitable examples.
   (b) Explain the significance of the following constituents present in coal.
      i. Moisture
      ii. Volatile matter
      iii. Ash and
      iv. Fixed carbon. [8+8]

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