Code No: R05010301 **Set No. 1**

**I B.Tech Regular Examinations, Apr/May 2007**
**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) Explain the terms temporary and permanent hardness of water.
   (b) How do you estimate the temporary hardness of water by EDTA method.
   (c) 50ml of a sample of hardwater was titrated against 0.01M EDTA, required 48ml of EDTA for titration. 50ml of the same hardwater after boiling and filtering etc. required 35ml of the EDTA for titration. Calculate the total and temporary hardness of water in degree clark. [4+8+4]
2. Write a brief account on the following:
   (a) Caustic embrittlment
   (b) Primming and foaming. [16]
3. Give an account of any eight factors that influence the rates of corrosion. [16]
4. Describe the process of dipping methods. [16]
5. (a) Distinguish between addition and condensation polymerization.
   (b) Explain the differences between Thermoplastics and Thermosetting Plastics.
   (c) What is meant by Degree of Polymerization? [6+6+4]
6. Write a note on lubricants with special reference to their classification, mode of action, examples and applications. [16]
7. (a) What are the functions of lubricants?
   (b) Write a note on extreme pressure lubrication. [8+8]
8. (a) What are the factors taken into consideration for selection of coal for different uses?
   (b) Describe the analysis of flue gas by Orsat?s apparatus with neat sketch. [8+8]

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Code No: R05010301 **Set No. 2**

**I B.Tech Regular Examinations, Apr/May 2007**
**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. Explain the following determinations of hardwater and its sigificance.
   (a) Chlorides
   (b) Dissolved Oxygen. [16]
2. Explain the basic principle, different methods, advantages and disadvantages of lime-soda process. [16]
3. Give an account of any eight factors that influence the rates of corrosion. [16]
4. Write note on: [16]
   (a) Solvent cleaning
   (b) Pickling and Etching
   (c) Sand blasting.
5. (a) Describe the preparation, properties and engineering, uses of polyethylene.
   (b) What is meant by Fabrication of plastics? Mention the different fabrication techniques. [8+8]
6. Define lubricant. Discuss the important properties of the lubricating oils. [16]
7. Describe the various types of lubrication. [16]
8. (a) Explain the recovery of by-product from 'Coke oven gas'
   (b) Give the comparison between solid, liquid and gaseous fuels. [8+8]

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Code No: R05010301 **Set No. 3**

**I B.Tech Regular Examinations, Apr/May 2007**
**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 are the different units in which the hardness of water is expressed? How are they related?
   (b) How do you estimate the temorary hardness of water by complexometric method? [4+12]

2. (a) Explain the cold lime soda process and hot lime soda process. What are the advantages of lime soda process?
   (b) 100ml of a water sample contains hardness equivalent to 25ml of 0.08 N $MgSO_4$. [8+8]
      i. What is the hardness of water sample in ppm?
      ii. What is the amount of lime and soda required for the treatment of the water sample?

3. (a) What is corrosion? What are the units in which it expressed? How is it different from errosion?
   (b) Explain the mechanism of electrochemical corrosion. [8+8]

4. Explain different types of Metallic Coatings. [16]

5. (a) What is a homochain polymer? Give examples.
   (b) What is polymerization? Explain the different types of polymerization with examples. [4+12]

6. Write a note on lubricants with special reference to their classification, mode of action, examples and applications. [16]

7. (a) What are the functions of lubricants?
   (b) Write a note on extreme pressure lubrication. [8+8]

8. (a) Describe the manufacture of Gasoline by Bergious process.
   (b) What is meant by knocking in I.C. engine? Explain the mechanism of knocking in chemical terms. [8+8]

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Code No: R05010301 **Set No. 4**

**I B.Tech Regular Examinations, Apr/May 2007**
**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) Give an account of the disadvantages of hardwater.
   (b) Distinguish between temporary and permanent hardness of water. [8+8]
2. Write a comparative account of the zeolite process and deionisation process for softening of hardwater. [16]
3. Differentiate the following with suitable examples.
   (a) Galvanic series and electrochemical series.
   (b) Pitting corrosion and stress corrosion. [8+8]
4. Write short note on: [16]
   (a) Tinning
   (b) Phosphate coating
   (c) Varnishes.
5. (a) What is a plastic?
   (b) Write the merits and demerits of using plastics in place of metals?
   (c) Explain the differences between a thermo set and thermo plastic material with examples. [4+6+6]
6. Write a note on lubricants with special reference to their classification, mode of action, examples and applications. [16]
7. Explain the following properties of lubricants. [16]
   (a) Mechanical stability
   (b) Carbon residue
   (c) Precipitation number
   (d) Aniline point.
8. (a) Explain Higher Calorific Value and Lower Calorific Value and distinguish the both.
   (b) What are the characteristics of a good fuel? [8+8]

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