Code No: R07A1BS07 **R07** **Set No. 2**

I B.Tech Examinations,December 2010
ENGINEERING CHEMISTRY
Common to Mechanical Engineering, Mechatronics, Production Engineering, Automobile Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Define lubricant and lubrication.
   (b) Explain the mechanism of lubrication behind delicate machines like watches, and clock etc.
   (c) What is meant by oiliness of a lubricant? How can this be improved?[4+6+6]
2. (a) Calculate the amounts of lime (85% pure) and soda (95% pure) required to soften a million litres of water containing the following constituents per litre $Ca(HCO_3)_2$ -243 mg/L; $Mg(HCO_3)_2$-73mg/L; $CaSO_4$-102 mg/L; $MgCl_2$-95mg/L; and NaCl- 500mg/L.
   (b) Explain the requisites of water used for paper mills, textile and dyeing industry, sugar industry and beverage industry. [8+8]
3. (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]
4. (a) Describe the rusting of iron using acid corrosion theory.
   (b) Explain electrochemical theory of corrosion with suitable examples. [4+12]
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) Describe the principle, process of electroplating with an example.
   (b) Why utensils coated with zinc are not used for storing food stuff whereas tin coated utensils are used? [12+4]
7. Write a short notes on the following:
   (a) Break - point chlorination
   (b) Dissolved oxygen
   (c) Hardness of water

(d) Sedimentation and coagulation. [4+4+4+4]

8. (a) What are the different varieties of coal? Give the physical state, percentage of carbon, calorific value, and application in each case.

(b) What volume of air is required for the complete combustion of the followings:

i. 10 m^3 of Hydrogen

ii. 5 m^3 of Methane. [8+8]

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Code No: R07A1BS07 **R07** **Set No. 4**

I B.Tech Examinations,December 2010
ENGINEERING CHEMISTRY
Common to Mechanical Engineering, Mechatronics, Production Engineering, Automobile Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Calculate the amounts of lime (85% pure) and soda (95% pure) required to soften a million litres of water containing the following constituents per litre $Ca(HCO_3)_2$ -243 mg/L; $Mg(HCO_3)_2$-73mg/L; $CaSO_4$-102 mg/L; $MgCl_2$-95mg/L; and NaCl- 500mg/L.
   (b) Explain the requisites of water used for paper mills, textile and dyeing industry, sugar industry and beverage industry. [8+8]

2. (a) Explain the preparation, properties and uses of Bakelite.
   (b) Describe with a neat sketch, the process of compression moulding. [10+6]

3. Write a short notes on the following:
   (a) Break - point chlorination
   (b) Dissolved oxygen
   (c) Hardness of water
   (d) Sedimentation and coagulation. [4+4+4+4]

4. (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]

5. (a) Describe the principle, process of electroplating with an example.
   (b) Why utensils coated with zinc are not used for storing food stuff whereas tin coated utensils are used? [12+4]

6. (a) What are the different varieties of coal? Give the physical state, percentage of carbon, calorific value, and application in each case.
   (b) What volume of air is required for the complete combustion of the followings:
      i. 10 m^3 of Hydrogen
      ii. 5 m^3 of Methane. [8+8]

Code No: R07A1BS07 **R07** **Set No. 4**

7. (a) Describe the rusting of iron using acid corrosion theory.
   (b) Explain electrochemical theory of corrosion with suitable examples. [4+12]

8. (a) Define lubricant and lubrication.
   (b) Explain the mechanism of lubrication behind delicate machines like watches, and clock etc.
   (c) What is meant by oiliness of a lubricant? How can this be improved?[4+6+6]

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Code No: R07A1BS07 **R07** **Set No. 1**

I B.Tech Examinations,December 2010
ENGINEERING CHEMISTRY
Common to Mechanical Engineering, Mechatronics, Production Engineering, 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 preparation, properties and uses of Bakelite.
   (b) Describe with a neat sketch, the process of compression moulding. [10+6]
2. (a) Describe the rusting of iron using acid corrosion theory.
   (b) Explain electrochemical theory of corrosion with suitable examples. [4+12]
3. (a) Calculate the amounts of lime (85% pure) and soda (95% pure) required to soften a million litres of water containing the following constituents per litre $Ca(HCO_3)_2$ -243 mg/L; $Mg(HCO_3)_2$-73mg/L; $CaSO_4$-102 mg/L; $MgCl_2$-95mg/L; and NaCl- 500mg/L.
   (b) Explain the requisites of water used for paper mills, textile and dyeing industry, sugar industry and beverage industry. [8+8]
4. (a) What are the different varieties of coal? Give the physical state, percentage of carbon, calorific value, and application in each case.
   (b) What volume of air is required for the complete combustion of the followings:
      i. 10 m^3 of Hydrogen
      ii. 5 m^3 of Methane. [8+8]
5. (a) Define lubricant and lubrication.
   (b) Explain the mechanism of lubrication behind delicate machines like watches, and clock etc.
   (c) What is meant by oiliness of a lubricant? How can this be improved?[4+6+6]
6. Write a short notes on the following:
   (a) Break - point chlorination
   (b) Dissolved oxygen
   (c) Hardness of water
   (d) Sedimentation and coagulation. [4+4+4+4]
7. (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]

8. (a) Describe the principle, process of electroplating with an example.
   (b) Why utensils coated with zinc are not used for storing food stuff whereas tin coated utensils are used? [12+4]

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Code No: R07A1BS07 **R07** **Set No. 3**

I B.Tech Examinations,December 2010
ENGINEERING CHEMISTRY
Common to Mechanical Engineering, Mechatronics, Production Engineering, Automobile Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe the rusting of iron using acid corrosion theory.
   (b) Explain electrochemical theory of corrosion with suitable examples. [4+12]
2. (a) Define lubricant and lubrication.
   (b) Explain the mechanism of lubrication behind delicate machines like watches, and clock etc.
   (c) What is meant by oiliness of a lubricant? How can this be improved?[4+6+6]
3. (a) Describe the principle, process of electroplating with an example.
   (b) Why utensils coated with zinc are not used for storing food stuff whereas tin coated utensils are used? [12+4]
4. (a) Explain the preparation, properties and uses of Bakelite.
   (b) Describe with a neat sketch, the process of compression moulding. [10+6]
5. (a) Calculate the amounts of lime (85% pure) and soda (95% pure) required to soften a million litres of water containing the following constituents per litre $Ca(HCO_3)_2$ -243 mg/L; $Mg(HCO_3)_2$-73mg/L; $CaSO_4$-102 mg/L; $MgCl_2$-95mg/L; and NaCl- 500mg/L.
   (b) Explain the requisites of water used for paper mills, textile and dyeing industry, sugar industry and beverage industry. [8+8]
6. (a) What are the different varieties of coal? Give the physical state, percentage of carbon, calorific value, and application in each case.
   (b) What volume of air is required for the complete combustion of the followings:
      i. 10 m^3 of Hydrogen
      ii. 5 m^3 of Methane. [8+8]
7. (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]

8. Write a short notes on the following:
   (a) Break - point chlorination
   (b) Dissolved oxygen
   (c) Hardness of water
   (d) Sedimentation and coagulation. [4+4+4+4]

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