

Code No: R10204/R10

**Set No. 1**

**I B.Tech II Semester Supplementary Examinations, Feb/Mar 2014**  
**ENGINEERING CHEMISTRY -II**  
 ( Common to Civil Engineering, Electrical & Electronics Engineering,  
 Mechanical Engineering, Electronics & Communication Engineering,  
 Computer Science & Engineering, Chemical Engineering, Electronics &  
 Instrumentation Engineering, Bio-Medical Engineering, Information  
 Technology, Electronics & Computer Engineering, Aeronautical  
 Engineering, Bio-Technology, Automobile Engineering, Mining and  
 Petroleum Technology)

**Time: 3 hours**

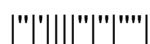
**Max Marks: 75**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) Give the preparation, properties & uses of Poly tetrafluoro ethylene?  
 (b) How do you distinguish between atactic, syndiotactic and isotactic polymers?  
 (c) What is meant by Low density and High density polymers? Give its engineering applications? [5+5+5]
2. (a) Explain the Casting & Blowing fabrication methods of plastics?  
 (b) Write notes on applications of plastics? [6+9]
3. What is synthetic Rubber and describe the preparation properties and uses of any two synthetic Rubbers. [15]
4. (a) What is the effect of Nano Materials on food science  
 (b) What are fullerenes and how they are prepared  
 (c) Write any five engineering applications of Carbon Nano Tubes [5+5+5]
5. (a) Explain how Portland cement is manufactured?  
 (b) What are refractories? Why refractoriness under load is an important property of a refractory? [8+7]
6. (a) What are anti knocking agents? Describe the functioning of TEL.  
 (b) Write short notes on fractional distillation of petroleum.  
 (c) How are lubricants classified? [5+5+5]
7. Explain the effect of the following factors on the rate of corrosion.  
 (i) Nature of corrosion product. (ii) Anodic and cathodic areas.  
 (iii) pH (iv) Polarization of the electrode (v) Passivity of metal. [15]
8. Write notes on any THREE of the following methods of green synthesis  
 (a) Microwave induced method. (b) Super critical fluid extraction method.  
 (c) Phase transfer catalyst method. (d) Ionic Liquids [15]

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**Time: 3 hours**

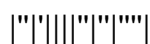
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1. (a) What are polymers and how are they utilized in the engineering field  
 (b) Briefly explain the free radical mechanism in addition polymerization  
 (c) Write notes on biodegradable polymers. [5+5+5]
2. (a) Discuss briefly fabrication of plastic articles?  
 (b) What is the kelvar? How is it prepared, give its properties and useses? [10+5]
3. (a) Natural Rubber needs vulcanization Give reasons  
 (b) Explain preparation, properties and uses of polyurethane. [7+8]
4. (a) How various types of carbon nano tubes can be formed from grapheme?  
 (b) Discuss how nano technology useful.  
 (c) What are the advancements of nano technology in Electronics Field [7+4+4]
5. (a) Discuss the effect of carbon dioxide, sulphur dioxide and chlorides on cement concrete  
 (b) What are refractories? How important are the properties of refractoriness under load and thermal conductivity, when the refractories are put to industrial use [8+7]
6. (a) With the help of line diagram describe fractional distillation of crude petroleum.  
 (b) Write notes on selection of lubricants for engineering applications. [8+7]
7. (a) Explain cathodic protection method of controlling corrosion.  
 (b) Write short notes on metallic coatings for corrosion prevention. [7+8]
8. Write notes on the following
  - (a) Aqueous phase method of green synthesis.
  - (b) Supercritical fluid extraction.
  - (c) Bio catalysts for green synthesis. [15]

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**Set No. 3**

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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) Explain the acid catalyzed mechanism of phenol formaldehyde resin?  
 (b) What are the steps involve in the free radical addition polymerization mechanism? Give an example?  
 (c) Explain the following terms.  
     (i) Functionality (ii) Degree of polymerization. [5+6+4]
2. (a) Write a short note on Bullet Proof plastics?  
 (b) Explain the fiber reinforced plastics and give its properties & applications?  
 (c) Give the synthesis of Kelvar? [6+6+3]
3. (a) What is an elastomer. Explain the characteristic of elastomers  
 (b) Write short note on Gutta Percha.  
 (c) Differentiate between a natural rubber and an elastomer. [7+3+5]
4. (a) What are nanomaterials? Discuss briefly about nanomaterials in one, two and three dimensions?  
 (b) What are the different nanomaterials that are used for engineering applications [10+5]
5. (a) Write the chemical reactions that take place (along with temperature) during the manufacture of portland cement  
 (b) What are ceramics? Discuss their classification [8+7]
6. (a) Write short notes on octane number.  
 (b) Write an essay on solid lubricants with emphasis on their classification, mechanism of their action, examples and applications. [8+7]
7. Explain the mechanism of the following types of corrosion.  
 (a) Crevice corrosion.

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- (b) Water- line corrosion.
- (c) Differential aeration corrosion. [15]
8. (a) What is Green Chemistry? Write briefly about Engineering Applications of Green Chemistry?
- (b) Discuss any four Principals of the Green Chemistry. [7+8]

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**Time: 3 hours**

**Max Marks: 75**

**Answer any FIVE Questions**  
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1. (a) What is the Zeigler – Natta Catalyst? Give its role in the coordination addition mechanism?  
 (b) PVC is soft and flexible where as Bakelite is hard and brittle Give the reason?  
 (c) Why do simple organic molecules not produce polymers? [8+4+3]
2. (a) Write a note on glass fiber reinforced plastics?  
 (b) Discuss the properties of plastics? [5+10]
3. (a) Natural Rubber needs vulcanization Give reasons  
 (b) Explain preparation, properties and uses of polyurethane. [7+8]
4. (a) Describe the production of carbon nano tubes by arc discharge method  
 (b) Mention the properties of fullerenes  
 (c) Write briefly about the physical properties of carbon nanotubes [8+4+3]
5. (a) What are the constituents of cement?  
 (b) Discuss about the classification of ceramics  
 (c) Write short notes on properties of refractories [5+5+5]
6. (a) Write notes on knocking and explain its role in fuel engines .  
 (b) Explain about fluid film and boundary lubrication [7+8]
7. Define Anodic and cathodic protection and explain the sacrificial anodic protection and impressed current cathodic protection. [15]
8. Green environment is a safer environment. What measures have to be taken for this and explain them in detail with suitable examples [15]

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