

Subject Code: R10204/R10

Set No - 1

I B.Tech II Semester Regular Examinations Oct./Nov. - 2013

ENGINEERING CHEMISTRY - II

(Common to All Branches)

Time: 3 hours

Max. Marks: 75

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

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- 1.(a) Explain free radical mechanism with example.
(b) Write about the preparation and properties of bakelite.
(c) Write notes on biodegradable polymers. [5+6+4]
- 2.(a) Write notes on (i) Bullet proof plastics. (ii) Glass Fiber reinforced plastics.
(b) With a neat sketch explain extrusion moulding [10+5]
- 3.(a) Write in detail about compounding of rubber.
(b) Give any five engineering applications of elastomers. [9+6]
- 4.(a) Discuss any two methods for the synthesis of carbon nanotubes.
(b) What are fullerenes? Give any four engineering applications of fullerenes. [8+7]
- 5.(a) Describe the manufacture of Portland cement by rotary kiln method.
(b) Discuss the following properties of refractories
(i) Refractoriness under load (ii) Refractoriness [9+6]
- 6.(a) Explain moving bed catalytic cracking method with a neat labeled diagram.
(b) Explain the terms octane number and cetane number.
(c) Write any four applications of lubricants. [7+4+4]
- 7.(a) Explain differential aeration corrosion, & galvanic corrosion.
(b) Explain the constituents of paints.
(c) Differentiate between galvanizing and tinning. [6+5+4]
- 8.(a) Discuss the principles of green chemistry.
(b) Explain in detail any two methods of green synthesis. [5+10]

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Set No - 2

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ENGINEERING CHEMISTRY - II

(Common to All Branches)

Time: 3 hours

Max. Marks: 75

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

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- 1.(a) Explain the significance of Zeigler-Natta Catalyst.
(b) Explain addition and condensation polymerization with example.
(c) Write about the preparation and properties of polyvinyl chloride. [5+5+5]
- 2.(a) Write notes of fiber reinforced plastics.
(b) With a neat sketch explain extrusion moulding.
(c) Give any four properties of plastics. [5+5+5]
- 3.(a) Explain how Buna-N rubber is prepared? What are its important applications?
(b) What are the limitations of natural rubber? How does vulcanization improve the properties of rubber?
(c) Give any five engineering applications of elastomers. [4+7+4]
- 4.(a) Describe the production of carbon nanotubes by laser ablation method with a neat sketch.
(b) Write the engineering applications of carbon nanotubes.
(c) Discuss the properties of fullerenes. [5+5+5]
- 5.(a) Explain setting and hardening of cement with suitable chemical equations.
(b) Write notes on glazed and unglazed clays.
(c) Explain the classification of refractories based on chemical composition with examples. [7+4+4]
- 6.(a) Write short notes on fractional distillation of petroleum with a neat sketch diagram.
(b) Write notes on antiknocking agents
(c) Describe the mechanism of thick film and thin film lubrication. [5+3+7]
- 7.(a) Explain the mechanism of pitting and galvanic corrosion.
(b) Discuss on the metallic coatings (i) Electroplating (ii) Electroless plating.
(c) Explain how corrosion can be controlled by proper selection and designing. [5+6+4]
- 8.(a) Explain aqueous phase method and supercritical fluid extraction method of green synthesis.
(b) Discuss any five applications of green chemistry. [10+5]

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Set No - 3

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ENGINEERING CHEMISTRY - II

(Common to All Branches)

Time: 3 hours

Max. Marks: 75

**Answer any FIVE Questions
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- 1.(a) Write about the preparation and properties of polycarbonates
(b) Explain the physical and mechanical properties of polymers
(c) What is glass transition temperature? [4+8+3]
- 2.(a) Write notes on
(i) Fiber reinforced plastics (ii) Bullet proof plastics
(b) With a neat sketch explain extrusion and compression moulding. [8+7]
- 3.(a) Write in detail about compounding of rubber.
(b) Explain how polyurethane rubber is prepared? What are its important applications?
(c) Write the structure of natural rubber and Gutta Percha. [8+4+3]
- 4.(a) Describe the production of carbon nanotubes by arc discharge method with a neat sketch.
(b) Explain the properties of carbon nanotubes.
(c) Discuss on the applications of fullerenes. [5+5+5]
- 5.(a) Write notes on glazed & unglazed ceramics. Give any four engineering applications of ceramics.
(b) Classify types of refractories based on chemical composition with examples.
(c) Discuss the effect of CO₂ on cement concrete. [8+4+3]
- 6.(a) What is meant by cracking of oil? Explain fluid bed catalytic cracking method with a labeled diagram.
(b) Explain the terms octane number and cetane number.
(c) Discuss on (i) Cloud and Pour Point (ii) Aniline Point [6+4+5]
- 7.(a) Explain the factors affecting corrosion.
(b) What is the role of sacrificial anode in corrosion control?
(c) State and explain Pilling Bedworth rule. [8+4+3]
- 8.(a) Describe the phase transfer catalyst for green synthesis.
(b) Discuss the principles of green chemistry.
(c) Discuss on the (five) applications of green chemistry. [4+6+5]

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Set No - 4

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ENGINEERING CHEMISTRY - II

(Common to All Branches)

Time: 3 hours

Max. Marks: 75

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

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- 1.(a) Write notes on stereospecific polymers.
(b) Write about the preparation and properties of Teflon.
(c) Explain the physical and mechanical properties of polymers. [4+4+7]
- 2.(a) With a neat sketch explain extrusion moulding and injection moulding.
(b) Write notes of fiber reinforced plastics. [10+5]
- 3.(a) What are the drawbacks of natural rubber? How does vulcanization improve the properties of rubber?
(b) Write about the preparation and properties of polyurethanes.
(c) Give any five engineering applications of elastomers. [7+4+4]
- 4.(a) Describe the production of carbon nanotubes by arc discharge and chemical vapour deposition method.
(b) Write the (atleast three each) engineering applications of carbon nanotubes and fullerenes. [9+6]
- 5.(a) Explain setting and hardening of cement with suitable chemical reactions.
(b) Write notes on (i) Thermal spalling (ii) Refractoriness
(c) Define glazed and unglazed ceramics. [7+4+4]
- 6.(a) Write short notes on refining and reforming of gasoline.
(b) Describe Fischer Tropsh method with a neat labeled diagram.
(c) Describe the mechanism of extreme pressure lubrication. [8+4+3]
- 7.(a) Discuss how corrosion can be minimized using the cathodic protection method.
(b) Explain differential aeration corrosion and pitting corrosion.
(c) Discuss the differences between tinning and galvanizing [6+6+3]
- 8.(a) Explain in detail any three methods of green synthesis
(b) Discuss on the applications of green chemistry. [12+3]