Code No: R10204 / R10 **Set No. 1**

I B.Tech II Semester Supplementary Examinations January / February - 2012

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) What is the specialty of Zeigler- Natta catalysis? Explain with a suitable example.
(b) Write a brief note on bio-degradable polymers.
(c) What is Bakelite? How is it produced?

[5M + 5M + 5M]

2.(a) What is compounding of plastics? What are the additives added to the resins before moulding them?
(b) Write briefly about fibre-reinforced plastics.
(c) Explain four engineering applications of plastics.

[5M + 5M + 5M]

3.(a) What are elastomers? How is natural rubber produced?
(b) What is poly-urethane? How is it produced and what are its important applications?
(c) Why vulcanization of rubber improves its properties?

[5M + 5M + 5M]

4.(a) What are carbon nano tubes? How do the SWNT and MWNT differ?
(b) Describe a method for the production of carbon nano tubes.
(c) Discuss the applications (at least three) of fullerenes.

[5M + 5M + 5M]

5.(a) Describe a method for the manufacture of cement.
(b) Discuss the role played by carbon dioxide in the decay of cement concrete.
(c) What are refractories? Why refractoriness under load is an important property of a refractory?

[7M + 3M + 5M]

6.(a) What are the advantages and limitations of liquid fuels compared to solid fuels?
(b) Explain thick film lubrication.
(c) Explain the term octane number of a fuel.

[5M + 5M + 5M]

7.(a) Explain briefly the factors that influence rate of corrosion of a metal.
(b) Write notes on cathodic protection.
(c) What re advantages of galvanization compared to tinning

[5M + 5M + 5M]

8. Writes notes on any three of the following:
(i) Necessity of green chemistry
(ii) Important principles of green chemistry
(iii) Aqueous phase method of green synthesis
(iv) Supercritical fluid extraction

[5M + 5M + 5M]

Code No: R10204 / R10 **Set No. 2**

I B.Tech II Semester Supplementary Examinations January / February - 2012

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 with examples, condensation and addition polymerizations.
(b) Write briefly about stereo specific polymers.
[8M + 7M]

2.(a) What are the limitations of natural rubber? How does vulcanization improve the properties of natural rubber?
(b) Write notes on preparation, properties and uses of styrene-butadiene rubber
[9M + 6M]

3.(a) Mention, at least four, different types of moulding techniques that are employed for plastics. Explain extrusion moulding.
(b) Write a brief note on fibre reinforced plastics.
(c) Explain briefly the use of fillers in compounding plastics.
[6M + 5M + 4M]

4.(a) Describe how carbon nano tubes are produced by laser ablation method.
(b) Explain the important applications (at least four) of carbon nano tubes.
(c) Write notes on Quantum dots.
[6M + 5M + 4M]

5.(a) How are ceramics classified? Give examples for different classes.
(b) Explain setting and hardening of cement.
(c) What are the characteristics of refractory materials?
[5M + 7M + 3M]

6.(a) What is cracking of an oil and how this process is useful in petroleum industry?
(b) What is **cetane** number and how it differs from **octane** number?
(c) Explain the mechanism of thin film lubrication.
[5M + 5M + 5M]

7.(a) Explain briefly the electro-chemical theory of corrosion.
(b) Write briefly about impressed current method of cathodic protection.
(c) What are anodic and cathodic metallic coatings that are used to control corrosion? Explain with suitable examples.
[6M + 3M + 6M]

8.(a) What are the principles of green chemistry?
(b) With suitable examples explain any two methods of green synthesis.
(c) Mention three important applications of green chemistry.
[6M + 6M + 3M]

Set No. 3

Code No: R10204 / R10

I B.Tech II Semester Supplementary Examinations January / February - 2012

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 conducting polymers and bio degradable polymers.
(b) Give any five engineering applications of polymers

[10M + 5M]

2.(a) Differentiate between thermo plastics and thermo setting plastics.
(b) With a neat sketch explain injection moulding of plastics.
(c) What are plasticisers and why are they added to resins before fabrication?

[6M + 6M + 3M]

3.(a) What is natural rubber (chemical structure)? What changes take place during vulcanization of rubber and how does it improve the elasticity of the product?
(b) Explain two important engineering applications of elastomers.
(c) Write notes on Buna-N rubber.

[6M + 4M + 5M]

4.(a) What are the different nano materials that are used for engineering applications?
(b) Describe the production of carbon nano tubes by arc discharge method.
(c) What are fullerenes and how are they produced

[4M + 6M + 5M]

5.(a) What are the important chemical constituents of Portland cement and what would be their contribution towards the strength of cement concrete?
(b) Write note on glazed and unglazed ceramic materials.
(c) How are refractories classified? Explain the classification with examples.

[6M + 4M + 5M]

6.(a) Explain briefly the fractional distillation of petroleum.
(b) Write notes on anti-knocking agents that are used with petrol.
(c) What is viscosity index of an oil? How it is an important property?

[6M + 4M + 5M]

7.(a) What is Pilling-Bedworth rule? How is this useful to understand corrosion?
(b) Write notes on passivity of metals.
(c) Metallic coating is a method of controlling corrosion. Explain with examples.

[5M + 4M + 6M]

8.(a) Explain the important principles of green chemistry.
(b) Briefly explain supercritical fluid extraction method for green process.
(c) Why, as budding engineers, you should be interested in green chemistry?

[6M + 6M + 3M]

Set No. 4

Code No: R10204 / R10

I B.Tech II Semester Supplementary Examinations January / February - 2012

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) With a suitable example, explain co-polymerisation.
(b) Write notes on bio-degradable polymers.
(c) How is poly-vinyl chloride prepared? What are its important engineering applications
[4M + 5M + 6M]

2.(a) Two of the types of compounding substances added to resins before their fabrication are plasticizers and fillers. How do they improve the properties of the plastic?
(b) Explain compression moulding technique employed for fabrication of plastics.
(c) Write notes on glass fibre reinforced plastics.
[6M + 5M + 4M]

3.(a) What is rubber and how is it produced from natural sources.
(b) What is vulcanization of rubber and how does it improve the properties of rubber?
(c) Write notes on Buna – S rubber.
[5M + 5M + 5M]

4.(a) Describe a method of production of carbon nano tubes.
(b) Differentiate between SWNT and MWNT of carbon.
(c) Discuss engineering applications (at least three) of carbon nano tubes.
[6M + 4M + 5M]

5.(a) Compare the dry and wet processes for producing cement .
(b) Calcium sulphate (gypsum) is one of the raw materials used for the production of cement; what is the role played by gypsum?
(c) Write briefly about refractoriness of a refractory material.
[7M + 4M + 4M]

6.(a) Describe the Fischer-Tropsch process for the production of synthetic petrol.
(b) Explain the difference between knocking in petrol engines and diesel engines.
(c) What is lubrication and what are the functions that are served by a lubricant?
[6M + 5M + 4M]

7.(a) Explain with a suitable example differential aeration theory of corrosion.
(b) Explain the role of the nature of the metal on the rate of corrosion.
(c) Write a brief note on cathodic protection of a metal.
[5M + 5M + 5M]

8.(a) Discuss the principles (at least five) of green chemistry.
(b) Write notes on any TWO of the following methods of green synthesis:
(i) Aqueous phase method (ii) Microwave induced method
(iii) Supercritical fluid extraction method (iv) Phase transfer catalyst method
[5M + 10M]