

Code No: R10204/R10

I B.Tech II Semester Regular Examinations, June/July 2011

ENGINEERING CHEMISTRY - II

(Common to All Branches)

Time: 3 hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

★ ★ ★ ★ ★

1. (a) with suitable examples explain addition polymerization, condensation polymerization and co-polymerization.
(b) Give a brief account of conducting polymers.
(c) Write the preparation, properties and uses of Polystyrene OR Teflon
[5M + 5M + 5M]
2. (a) Write briefly about of compounding of plastics.
(b) With a neat sketch explain compression moulding.
(c) What are fibre reinforced plastics? Explain their strength properties.
[5M + 5M + 5M]
3. (a) Explain vulcanization of rubber.
(b) What are polyurethanes? How are the produced?
(c) How is Buna – N produced and what are its important properties?
[5M + 5M + 5M]
4. (a) Discuss the production of carbon nanotubes by Arc discharge method.
(b) Write briefly about the physical properties of carbon nanotubes.
(c) What are fullerenes? Explain the structure of C₆₀ fullerene.
[5M + 5M + 5M]
5. (a) Describe the production of cement indicating the reactions that take place during the manufacture.
(b) What are refractories? How are they classified? Give examples for different classes of refractories.
[10M + 5M]
6. (a) Describe the production of petrol from water gas.
(b) Explain the mechanism of thin film lubrication.
(c) What are the different varieties of crude oil generally obtained?
[6M + 6M + 3M]
7. (a) Using direct chemical attack theory, explain corrosion.
(b) What is cathodic protection? Explain with examples how cathodic protection can be used to protect iron.
[6M + 9M]
8. (a) What is green chemistry? What is the necessity of green chemistry?
(b) Write briefly about one engineering application of green chemistry.
(c) Discuss any four of the principles of green chemistry.
[4M + 3M + 8M]

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1. (a) Explain with an example the mechanism of free radical polymerization.
(b) What are biodegradable polymers? How are they useful?
(c) Explain the formation of Bakelite. What are its important uses?
[5M + 5M + 5M]
2. (a) Differentiate between thermoplastics and thermosetting plastics.
(b) What is Kevlar and how is it produced? What is its importance?
(c) Discuss a method of fabricating a thermoplastic material.
[5M + 5M + 5M]
3. (a) What are the drawbacks of raw rubber? How can they be overcome?
(b) Apart from vulcanizing agents what are the additives that are added to rubber and how do they improve the properties of rubber?
(c) Write briefly about preparation and uses of Buna – S rubber.
[5M + 5M + 5M]
4. (a) Write a short note on quantum dots and nanowires.
(b) Describe the production of carbon nanotubes by Laser ablation method.
(c) Write briefly about the important applications of carbon nanotubes.
[5M + 5M + 5M]
5. (a) Give a detailed account of setting and hardening of cement.
(b) Compare the dry and wet processes for producing cement.
(c) What are ceramics? How are the ceramics glazed?
[7M + 4M + 4M]
6. (a) What is cracking of oil? How is this useful in petroleum industry?
(b) Hydrogenation of coal is a source of petrol. Describe how petrol can be produced from this source
(c) Write notes on the viscosity index of a liquid lubricant.
[5M + 6M + 4M]
7. (a) Write a brief account of differential aeration corrosion.
(b) Differentiate between cathodic protection and cathodic (metal) coating.
(c) Write brief notes on galvanization.
[5M + 6M + 4M]
8. (a) Discuss two of the principles of green chemistry.
(b) Elaborate two synthetic methods of green chemistry.
[3M + 12M]

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1. (a) What is polymerization and what is degree of polymerization? Explain with examples.
(b) Write notes on stereo-specific polymers.
(c) How is Teflon produced? Discuss three important properties of Teflon.
[4M + 6M + 5M]
2. (a) Explain compounding of plastics.
(b) Describe how a FRP is produced.
(c) Differentiate between thermoplastics and thermosetting plastics.
[5M + 5M + 5M]
3. (a) What is natural rubber? How is it processed?
(b) Using chemical structures explain vulcanization of rubber. Explain how vulcanization improves the properties of rubber.
(c) Write notes on polyurethane.
[5M + 5M + 5M]
4. (a) Describe the production of carbon nanotubes by Chemical vapour deposition method.
(b) Write briefly about the important applications of carbon nanotubes.
(c) What are fullerenes and how are they produced?
[5M + 5M + 5M]
5. (a) Rotary kilns are used for manufacture of cement. What are the reactions that take place in different parts of the kiln during the manufacture.
(b) Explain the role of carbon dioxide and chloride ions in the deterioration of strength properties of cement concrete.
(c) What is spalling of a refractory? Explain how this is responsible for failure of a refractory
[5M + 5M + 5M]
6. (a) Explain knocking in IC engines using petrol as fuel..
(b) What are the merits and demerits of liquid fuels.
(c) Explain extreme pressure lubrication.
[6M + 5M + 4M]

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Set No. 3

7. (a) Explain briefly the factors that influence the rate of corrosion of a metal.
(b) Corrosion of iron can be controlled by coating it with metallic zinc or tin. Compare these two coatings highlighting their advantages and limitations.
(c) What is Pilling – Bedworth rule? How is it useful?
[5M + 6M + 4M]
8. (a) What is green chemistry and how is it important?
(b) Write notes on any two of the synthetic methods used in green chemistry.
[3M + 12M]

FirstRanker

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1. (a) How do you distinguish between atactic, syndiotactic and isotactic polymers? Explain with an example.
(b) Explain, with one example each, two important types of polymerization reactions.
(c) What is the importance of biodegradable polymers?
[6M + 4M + 5M]
2. (a) Explain how extrusion moulding can be used for fabrication of plastics
(b) What are the important properties in which thermosetting plastics differ from thermo plastics?
(c) Explain the strength properties of glass fibre reinforced plastics
[5M + 5M + 5M]
3. (a) How is natural rubber structurally represented?
(b) Write notes on Buna-S and Buna-N rubbers.
(c) Write notes on the engineering applications of elastomers.
[3M + 8M + 4M]
4. (a) What are the different types of single walled carbon nanotubes? Describe their structures.
(b) Write notes on the electrical properties of nanotubes.
(c) What are fullerenes? What are their important properties?
[7M + 4M + 4M]
5. (a) Write briefly about the properties / criteria of refractory materials.
(b) Explain briefly the manufacture of Portland cement.
[7M + 8M]
6. (a) Define Cetane Number of a fuel.
(b) Explain how catalytic cracking of an oil is better than thermal cracking to produce petrol.
(c) What is Aniline Number of an oil? How is it determined? How is this useful?
[3M + 6M + 6M]
7. (a) Explain electrochemical theory of corrosion.
(b) Explain hydrogen type and oxygen type corrosions.
(c) What are the important constituents of a(n organic) paint?
[8M + 4M + 3M]

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Set No. 4

8. (a) Discuss any four of the principles of green chemistry.
(b) Elaborate **any one** of the following methods of green synthesis
(i) Aqueous phase method
(ii) Supercritical fluid extraction method.

[8M + 7M]

FirstRanker