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# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal-500043, Hyderabad

**B.Tech II SEMESTER END EXAMINATIONS (REGULAR) - SEPTEMBER 2022**

Regulation:UG20

**CHEMISTRY**

**Time: 3 Hours**

(Common to AE | ECE | EEE | ME | CE)

**Max Marks: 70**

**Answer ALL questions in Module I and II**

**Answer ONE out of two questions in Modules III, IV and V**

**All Questions Carry Equal Marks**

**All parts of the question must be answered in one place only**

## MODULE – I

- (a) What are metallic coatings? Illustrate the electroplating method with the help of neat diagram.  
[BL: Understand| CO: 1|Marks: 7]

(b) i) Why galvanized containers are not used for storage of food products?  
ii) "Can we use aluminium in place of zinc for cathodic protection of rusting of iron". Explain with proper reason.  
iii) How is galvanization different from cathodic protection?  
iv) Formation of which type of metal oxide film cause rapid and continuous corrosion?  
[BL: Apply| CO: 1|Marks: 7]

## MODULE – II

- (a) Describe in detail the demineralization of water using ion exchange method with a neat diagram.  
[BL: Understand| CO: 2|Marks: 7]

(b) 100 ml of a given water sample required 20ml of 0.01M EDTA with Eriochrome black T as indicator. After boiling 100 ml of the same sample required 10ml of 0.01M EDTA. Calculate total, permanent and temporary hardness of given water sample.  
[BL: Apply| CO: 2|Marks: 7]

## MODULE – III

- (a) Write short note on elastomers. Give the preparation, properties and applications of Buna-S and Thiokol rubber.  
[BL: Understand| CO: 3|Marks: 7]

(b) i) Differentiate between condensation and additional polymerization.  
ii) Write preparation and applications of PVC  
iii) Why does raw rubber need vulcanization?  
iv) What are the monomers present on Nylon 66 ?  
[BL: Apply| CO: 4|Marks: 7]
- (a) Outline the following concepts associated with lubricants  
i) Boundary lubrication  
ii) Extreme pressure lubrication  
iii) Thick film lubrication  
[BL: Understand| CO: 4|Marks: 7]

(b) Give reasons for the following:  
i) Why is lubricant needed?  
ii) Teflon is an additional polymer, but it behaves somewhat like a thermosetting polymer.  
[BL: Apply| CO: 4|Marks: 7]

## MODULE – IV

5. (a) Summarize any one method of green synthesis with necessary equations. Give detailed account of LPG including its applications. [BL: Understand| CO: 5|Marks: 7]
- (b) Calculate the gross and net calorific values of a coal sample having the following composition Carbon=85%, Hydrogen=6%, Oxygen=2%, Sulphur=3%, Nitrogen=1% and Ash=3%. [BL: Apply| CO: 5|Marks: 7]
6. (a) What is a crude oil? Describe the refining of petroleum with various fractions obtained during refining and mention uses of each fraction [BL: Understand| CO: 5|Marks: 7]
- (b) A sample of coal contains the following composition Carbon=84%, Hydrogen=12%, Oxygen=2%, Sulphur =1% and the remainder being ash. Calculate the gross and net calorific values of the fuel. [BL: Apply| CO: 5|Marks: 7]

## MODULE – V

7. (a) Discuss in detail the causes and the preventive measures needed to be taken to control air pollution. [BL: Understand| CO: 6|Marks: 7]
- (b) Interpret how groundwater in many places in India become contaminated with fluoride and arsenic. List various methods to control water pollution in industries. [BL: Understand| CO: 6|Marks: 7]
8. (a) How soil pollution is caused by fertilizers? Describe in detail how soil erosion could affect the crop productivity [BL: Understand| CO: 6|Marks: 7]
- (b) "Dams are blamed as unsustainable". Why? Explain in detail with appropriate reason. Enlist the causes and effects of floods and droughts. [BL: Understand| CO: 6|Marks: 7]

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