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INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.TECH II Semester End Examinations (Regular) August- 2021

Regulation:UG20

CHEMISTRY

Time: 3 Hours

(ECE|EEE|AE|ME|CE)

Max Marks: 70

Answer all questions in Modules I and II

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

(NOTE: Provision is given to answer TWO questions from among one of the Modules III / IV / V)

All Questions Carry Equal Marks

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

MODULE – I

- What product forms from the lead components of a lead storage battery? Explain construction with chemical reactions? Write its limitations, advantages and applications. [7M]
 - The standard reduction potentials of Zn^{+2}/Zn and Cu^{+2}/Cu are $-0.76V$ and $+0.34V$ respectively. What is the e.m.f of the cell?
 $Zn(s)/Zn^{+2}(0.05M) // Cu^{+2}(0.005M)|Cu(s)$. [7M]

MODULE – II

- Discuss ion exchange process of water softening with neat diagram. Give the chemical reactions where ever necessary? [7M]
 - Two samples of canal water are collected at a distance of 1.5 kms. 100 ml of the water sample collected at point one requires 24 ml of EDTA solution on titration. 100 ml of the water sample collected at point 2 required 20 ml of EDTA solution on titration. 100 ml of SHW (0.28 gms of $CaCO_3$ per liter) requires 22 ml of EDTA solution on titration. Discuss the result and conclusion. [7M]

MODULE – III

- Explain the compounding of plastics and summarize its significance with suitable examples. [7M]
 - Discuss the preparation, properties of polymers used in fabricating switches and non lubricating bearings. [7M]
- Explain why natural rubber needs vulcanization and summarize its significance. [7M]
 - What is a lubricant? Discuss thick film, thin film, and extreme pressure lubrication mechanisms. [7M]

MODULE – IV

5. (a) Discuss the significance of proximate analysis and ultimate analysis in detail. [7M]
(b) What is green chemistry? Explain the following methods for green synthesis:
i) Microwave method. ii) Ultrasound method [7M]
6. (a) Explain about composition, properties and applications of compressed natural gas. [7M]
(b) Calculate the gross and net calorific values of a coal sample having the following composition
Carbon=80%,Hydrogen=7%,Oxygen=3%,Sulphur=3.5%, Nitrogen=2% and Ash=5%. [7M]

MODULE – V

7. (a) What are water pollutants? Discuss various methods to control water pollution. [7M]
(b) Describe briefly droughts and floods with respect to their occurrence and impacts. [7M]
8. (a) What are primary and secondary air pollutants? Enumerate various methods to control air pollution. [7M]
(b) Describe various non-renewable and renewable sources of energy available for use in industrialized countries? What are the future prospects for increasing the use of renewable sources? [7M]

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