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# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - July, 2021

Regulation: UG-20

CHEMISTRY

Time: 3 Hours

(CSE|IT|CSE(AIML)|CSE(DS)|CSE(CS)|CSIT)

Max Marks: 70

Answer all questions in Module I and II

Answer ONE out of two questions from 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) Describe the construction and working of lead-acid battery. [7M]
- (b) Calculate the electrode potential of zinc metal dipped in 0.01 M  $ZnSO_4$  solution at 298K.  $E^0_{Zn^{2+}/Zn} = -0.76V$ . [7M]

## MODULE – II

- (a) What are the salts responsible for hardness? Write the disadvantages of using hard water in industries. [7M]
- (b) A water sample contains the following.  
 $Mg(HCO_3)_2 = 73mg/l$ ;  $MgCl_2 = 95mg/l$ ;  $NaCl = 410mg/l$ . Calculate temporary, permanent and total hardness of the sample water. [7M]

## MODULE – III

- (a) What you understand about the vulcanization of rubber? Write the advantages of vulcanization? [7M]
- (b) Explain the addition polymerization process with an example. [7M]
- (a) Describe the preparation, properties and applications of PVC and Teflon. [7M]
- (b) Explain the theories for the mechanism of the lubricants. [7M]

## MODULE – IV

- (a) Explain how the percentage of carbon, hydrogen, nitrogen, and sulphur are estimated in ultimate analysis of coal. [7M]
- (b) A sample of coal contains carbon= 60%, Hydrogen= 6% Oxygen=33% Sulphur = 0.5%, Nitrogen = 0.2%. Calculate HCV , LCV calorific value of the fuel. [7M]
- (a) Discuss the following methods for green synthesis i) Aqueous phase method. ii) Microwave method. [7M]
- (b) Describe the moisture, volatile matter, ash content and fixed carbon in proximate analysis of coal and its significance. [7M]

**MODULE – V**

7. (a) Describe the major sources of water pollution. What are its effects on environment? [7M]  
(b) Explain the causes, effects and control measure of flood and drought. [7M]
8. (a) Discuss the sources, effects and methods adopted to control air pollution in industries. [7M]  
(b) Explain the harnessing methods of solar energy, hydro power energy and wind energy. [7M]

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