Hall Ticket No | | | | | | | | | | |

Question Paper Code:AHSC06

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal-500043, Hyderabad

B.Tech I SEMESTER END EXAMINATIONS (REGULAR) - APRIL 2022
Regulation:UG-20
CHEMISTRY
(Common to CSE|CSE(AI&ML)|CSE(DS)|CSE(CS)|CSE(CSIT)|IT Branches)

Time: 3 Hours **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

1. (a) Distinguish between chemical and electrochemical corrosion. Discuss the mechanism of wet corrosion by evolution of hydrogen. **[7M]**

   (b) Explain the following giving reason:
   i) A porous plate or a salt bridge is not required in a lead storage lead storage cell.
   ii) A drop of an electrolyte is placed on an iron surface, rusting occurs in the central region.
   iii) Why the blue color of the $CuSO_4$ solution slowly discharged when a Zinc rod is dipped in it. **[7M]**

MODULE – II

2. (a) Draw the molecular structure of EDTA, EBT complex and the principle of complexometric titration with equations. **[7M]**

   (b) Calculate the total hardness of water in Fr^0 and ^0Cl from the following analysis of water sample. $Mg(HCO_3)_2$ = 20.8 mg/L, $Mg(NO_3)_2$ = 28.8 mg/L, $MgCl_2$ = 21.0 mg/L, $MgSO_4$ = 20.0.mg/L, $CaCO_3$ = 21.2 mg/L, KCl = 73.2 mg/L. **[7M]**

MODULE – III

3. (a) Draw the flowchart for the processing of natural rubber and explain the process of vulcanization of raw rubber. **[7M]**

   (b) Answer the following questions:
   i) Teflon is an addition polymer, but it behaves like a thermosetting polymer. Give reason.
   ii) Why do all simple organic molecules not produce polymers. Give reason.
   iii) Mention the monomer units of the following polymers. PVC, Bakelite, Natural rubber. **[7M]**

4. (a) What are lubricants and how are they classified? Explain the following properties of lubricants giving their significance.
   i) Flash point & Fire point ii) Cloud point & Pour point **[7M]**

   (b) Explain the following:
   i) How the viscosity index of oil can be improved?
   ii) Why are antioxidants added to hydrocarbon oils?
   iii) How can the oiliness of a lubricant be increased? **[7M]**

MODULE – IV

5. (a) Name the analysis of coal in which moisture, volatile matter, ash and fixed carbon are determined. Give significance of each component **[7M]**

   (b) A coal has the following composition by weight: C = 90%, O = 3%, S = 0.5%, N = 0.5%, H=5% and ash = 2.5%. Calculate higher calorific value and net calorific value of coal. (Latent heat of steam = 587). **[7M]**

6. (a) What are the benefits of green synthesis over conventional method of synthesis? **[7M]**

   (b) Exactly 1.5 g of coal was weighed into a silica crucible. After heating for 1 hr at 100^0C, the residue weighed 1.415g. The crucible was then covered with a vented lid and strongly heated for 7 minutes at 950^0C. The residue weighed 0.528 g. The crucible was then heated without the cover, until a constant weight was obtained. The last residue was found to weigh 0.254g. Calculate the percentage of moisture, volatile matter and ash content. **[7M]**

MODULE – V

7. (a) What is environmental pollution? Describe in brief the five important causes of air pollution. **[7M]**

   (b) Write the major anthropogenic causes of droughts and floods? Give its remedial measures. **[7M]**

8. (a) What do you understand by natural resources. Differentiate between renewable and non-renewable resources. **[7M]**

   (b) "Water is a unique resource". Comment on this statement.What are the various methods to control water pollution in industries? **[7M]**

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