

FACULTY OF ENGINEERING**B.E. I – Semester (AICTE) (Main & Backlog) Examination, December 2019****Subject: Chemistry****Time: 3 Hours****Max.Marks: 70****Note: Answer all questions from Part-A and any five questions from Part-B****PART – A (10x2 = 20 Marks)**

- 1 Write the cell reaction for the cell consisting of Calomel electrode and Quinhydrone electrode.
- 2 How are free energy change of cell reaction and electrical work done by the cell are related?
- 3 Give few reasons for preferring ozone to chlorine in disinfection of water.
- 4 When copper is in contact with Iron what will be corroded and why?
- 5 What is the requirement for a simple organic compound to function as a monomer?
- 6 Give the polymerization reaction for silicone rubber.
- 7 Give Dulong's formula and relate HCV to LCV.
- 8 What is the effect of hydrogen and oxygen on the calorific value of fuel?
- 9 Give examples of clean technology.
- 10 Explain carbon neutrality of bio-diesel.

PART – B (5x10 = 50 Marks)

- 11 a) Analyze the determination of thermodynamic parameters for cell reaction taking place in the galvanic cell? (6)
- b) For a cell $\text{Pt}|\text{H}_2(1\text{atm})|\text{H}^+(0.1\text{M})||\text{Cu}^{2+}(0.01\text{M})|\text{Cu}$, calculate emf of the cell if standard electrode potentials of copper electrode and hydrogen electrode are +0.34V and 0.00V respectively. (4)
- 12 a) Explain factors influencing the rate of corrosion. (6)
- b) A 100ml of sample water required 60ml of 0.02M HCl upto phenolphthalein end point and then required 40ml of 0.02M HCl upto methyl orange end point. Calculate the type of alkalinity present in the water? (4)
- 13 a) Give preparation, properties and uses of (3+3)
 - 1) Kevlar
 - 2) Silicone rubber
- b) Give preparation, properties and applications of polylactic acid. (4)
- 14 a) Explain ultimate analysis of coal with its significance. (6)
- b) Calculate GCV and NCV of a coal sample having a chemical composition of C=80%, H=7%, S=3.5%, N=2.1%, O=3%, and ash=4.4%. (4)
- 15 a) Give principles of Green chemistry and explain atom economy and catalysis with examples. (6)
- b) Explain properties of matrix and reinforcement phases of composite materials with examples. (4)
- 16 a) Describe fractional distillation of petroleum and discuss the uses of petroleum fractions? (6)
- b) Explain purification of sea water by reverse osmosis? (4)
- 17 a) Explain proximate analysis of coal with its significance. (6)
- b) Explain determination of octane number and give the relation of octane number to composition of the petrol? (4)