Code No. 2878/AICTE/S

FACULTY OF ENGINEERING

B.E. (CE/EE/Inst./ECE/CSE/CME) (AICTE) I-Semester (Suppl.) Examination, December 2020

Subject : Chemistry

Time : 2 Hours **Max. Marks: 70**

Note: (Missing data if, any can be assumed suitable)

PART – A

Note: Answer any five questions. **(5 x 2 = 10 Marks)**

1 Define knocking and how can it be minimized.

2 Explain the significance of break point chlorination.

3 Classify reference electrodes with examples.

4 Write the Nernst's equation of a reduction reaction of quinhydrone electrode.

5 Give any four differences between Thermoplastic and Thermosetting polymers.

6 Write the chemical reaction involved in the synthesis of Nylon 6:6.

7 Give the reaction showing the synthesis of Biodiesel through Transesterifcation.

8 Define pitting corrosion and give example.

9 Write the chemical reactions involved in catalytic cracking.

10 Explain the significance of ultimate analysis of coal.

PART – B

Answer any four questions. **(4 x 15 = 60 Marks)**

11 (a) Explain the construction, working and applications of standard calomel electrode.

(b) The emf of the following cell
Pt / $H_{2(g)(1\ atm)}$ / $H^{+}_{(1m)}$ // Hg_2Cl_2 / $KCl_{(satd)}$ / Hg was found to be 0.228v at 25°C. Calculate the pH of the solution. (E^{o}_{cell} = 0.2145 v).

12 (a) Discuss the various factors influencing the rate of corrosion.

(b) Calculate the temporary, permanent and total hardness of a water sample is °Cl, °Fr from the following data. 20 ml of 0.05m of standard hard water required 40 ml of EDTA for titration. 20 ml of sample of hard water has consumed 30 ml of same EDTA. 20 ml of boiled, cooled and filtered water required 20 ml of EDTA, for titration.

13 (a) Explain the preparation, properties and industrial applications of PVC and Bakelite.

(b) Describe the mechanism of conduction in polyacetylene.

14 (a) Give an account of composition of LPG and CNG. Mention their uses.
(b) A sample of coal contains the following composition-carbon = 84% ; Hydrogen = 12% ; oxygen = 2% ; sulphur = 1% and remaining being ash. Calculate the gross and net calorific values of the fuel.

15 (a) Discuss the twelve principles of green chemistry.
(b) What do you understand by atom economy? Explain its role in green synthesis.

16 (a) Classify the composite materials based on matrix and reinforcement.
(b) Discuss the applications of composites.

17 (a) A sample of hardwater on analysis was found to contain 27.2 mg/lit of $CaSO_4$, 14.6 mg/it of $Mg(HCO_3)_2$, 6 mg/lit of $MgSO_4$, 9.5 mg/lit of $MgCl_2$; 100 mg/lit of NaCl. Calculate the total, temporary and permanent hardness of water sample.
(b) Define hot dipping and discuss the process of galvanizing with a neat sketch.

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