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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**MAKE-UP EXAMINATION SEP 2023**

**Course Code**: CHE 101

**Course Name**: Engineering Chemistry

**Program** : B.Tech

**Date**: 06.10.2023

**Time**: 9:30 AM to 12:30 PM

**Max Marks**: 100

**Weightage**: 50%

**Instructions:**

1. *Read the question properly and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and Non-programmable calculators are permitted.*

**Part A [Memory Recall Questions]**

**Answer all the Questions. (10Qx2M=20M)**

1. What kind of bond will be there in a) KCl and b) CH4?

(C.O.NO.1) [Knowledge Level]

2. Name the type of intermolecular force present in water and acetone.

(C.O.NO.1)[Knowledge Level]

3. Classify polymers according to their tacticity.

(C.O.NO.2) [Knowledge Level]

4. What is thermoplastic polymer?

(C.O.NO.2) [Knowledge Level]

5. What is the electrolyte of LiMnO2 battery?

(C.O.NO.3) [Comprehensive Level]

6. Write the expression of Nernst equation.

(C.O.NO.3) [Comprehensive Level]

7. Give two examples of primary solid fuel. (C.O.NO.3) [Comprehensive Level]

8. What is temporary hardness? (C.O.NO.4) [Comprehensive Level]

9. Mention the units that are used to express the degree of hardness.

(C.O.NO.4) [Comprehensive Level]

10. State any two methods for corrosion control. (C.O.NO.4) [Comprehensive Level]

**Part B [Thought Provoking Questions]**

**Answer all the Questions. (5Qx10M=50M)**

11. Bakelite is a condensation thermosetting polymer. (a) Discuss the synthesis of Bakelite with suitable reactions. (b) What is the application of Bakelite?

(C.O.NO.2) [Knowledge Level]

12. Dry cell is a primary classical battery. Discuss the construction and working of dry cell battery with a neat labelled diagram. (C.O.NO.3) [Comprehension Level]

13. Refining of crude oil is done by fluidized bed catalytic cracking process. (a) Describe fluidized bed catalytic cracking with a neat labelled diagram. (b) What are the optimum conditions of the process? (C.O.NO.3) [Comprehension Level]

14. Boiler corrosion degrades and damages the surface of boiler. (a) Give detail explanation how boiler corrosion occurs due to the presence of dissolved oxygen in boiler feed water (b) Discuss any one respective measure to prevent boiler corrosion.

(C.O.NO.4) [Comprehension Level]

15. Electroplating is one of the methods used to prevent corrosion on metal surfaces. (a) Describe the conditions involved in the electroplating of hard and decorative chromium. (b) Write applications of hard and decorative electroplating of chromium. (C.O.NO.4) [Comprehension Level]

**Part C [Problem Solving Questions]**

**Answer all the Questions. (2Qx15M=30M)**

16. Calculate the gross calorific value (high calorific value) and net calorific value (low calorific value) of a solid fuel from the following data:

Weight of coal = 0.83 kg, weight of water taken in calorimeter = 3500 kg, water equivalent of calorimeter = 385 kg, Initial temperature of water = 25 oC, Final temperature of water = 27.3 oC, %hydrogen = 0.7%, Specific heat of water = 4.187 kJ/kg/oC, Latent heat of steam = 2457 KJ/Kg.

(C.O.NO.3) [Comprehension Level]

17. Calculate the temporary hardness, permanent hardness and total hardness of a water sample containing the following: Ca(HCO3)2 : 7.2 mg/L; Mg(HCO3)2 : 8.5 mg/L ; MgSO4 : 4.8 mg/L ; MgCl2 : 4.9 mg/L ; CaSO4 : 12.1 mg/L. (Atomic Weights: Ca:40, Mg: 24, H: 1, C: 12, O:16, S: 32, Cl: 35.5, N: 14)

(C.O.NO.4) [Comprehension Level]