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**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING  
END TERM EXAMINATION - FEB 2023**

**Semester :** Semester I - 2022

**Course Code :** CHE1017

**Course Name :** Sem I - CHE1017 - Engineering Chemistry

**Program :** B.Tech - (CIV & PET)

**Date :** 20-FEB-2023

**Time :** 1.00PM - 4.00PM

**Max Marks :** 100

**Weightage :** 50%

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**Instructions:**

- (i) Read all questions carefully and answer accordingly.*
  - (ii) Question paper consists of 3 parts.*
  - (iii) Scientific and non-programmable calculator are permitted.*
  - (iv) Do not write any information on the question paper other than Roll Number.*
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**PART A**

**ANSWER ALL THE QUESTIONS**

**(10 X 2 = 20M)**

1. Vulcanization of rubber is done by
  - a) Heating rubber (CO1) [Knowledge]
  - b) Addition of a coagulant
  - c) Addition of sulphur
  - d) All of the above
2. Li-ion battery belongs to which class?
  - a) Primary (CO2) [Knowledge]
  - b) Secondary
  - c) Reserve
  - d) None of the above
3. Anode in the case of Lead Acid battery is
  - a) Lead (CO2) [Knowledge]
  - b) Lead dioxide
  - c) Sulfuric acid
  - d) None of the above

4. In the case of cathodic protection of a metal  
a) Metal is forced to behave as cathode (CO3) [Knowledge]  
b) Metal is forced to behave as anode  
c) Metal is forced to behave both as anode and cathode alternatively  
d) None of the above
5. In a polymer, number of repeating units is called  
a) Degree of polymerization (CO3) [Knowledge]  
b) Tacticity  
c) Functionality  
d) None of the above
6. Polymers which undergo very long elongation (500–1000%) when subjected to an external force, but readily regain their original position when external force is removed are called as  
a) Fibers (CO3) [Knowledge]  
b) Fiber reinforced plastics  
c) Nylon  
d) Elastomers
7. Total hardness is expressed as  
a) Temporary hardness+ Permanent hardness (CO4) [Knowledge]  
b) Temporary hardness- Permanent hardness  
c) Temporary hardness\*Permanent hardness  
d) Temporary hardness/Permanent hardness
8. Removal of scales is not possible by  
a) thermal shocks (CO4) [Knowledge]  
b) filtration  
c) Treating with HCl  
d) Scraping
9. The concentration of hardness which is always expressed in terms of equivalents of CaCO<sub>3</sub> is called  
\_\_\_\_\_ (CO4) [Knowledge]  
a) Degree of hardness  
b) Moles of hardness  
c) Both A and B  
d) Neither True nor False
10. Which among the following is not a physical impurity of water  
a) Turbidity (CO4) [Knowledge]  
b) Arsenic  
c) Colour odour  
d) Default option text

## PART B

**ANSWER ALL THE QUESTIONS**

**(5 X 10 = 50M)**

11. What are polymer composites? Give it's types with suitable example. (CO1) [Comprehension]

12. Define a fuel cell? Explain the working of H<sub>2</sub>-O<sub>2</sub> fuel cell.  
(CO2) [Comprehension]
13. Outline the differences between differential aeration and differential metal corrosion.  
(CO3) [Comprehension]
14. Explain how anodic coating and cathodic coating protect substrate material from corrosion?  
(CO3) [Comprehension]
15. Name the three main reasons of boiler corrosion? Explain any two methods to remove dissolved oxygen from boiler feed water.  
(CO4) [Comprehension]

### PART C

#### ANSWER ALL THE QUESTIONS

(2 X 15 = 30M)

16. Elaborate on electroplating of chromium by listing out the differences between hard and decorative chromium plating.  
(CO3) [Application]
17. Calculate the Total hardness, Temporary Hardness and Permanent Hardness (in degree French and degree Clarke) of a water sample containing: Ca(HCO<sub>3</sub>)<sub>2</sub>=15 ppm, Mg(HCO<sub>3</sub>)<sub>2</sub>=25 ppm, CaSO<sub>4</sub>=30 ppm, MgSO<sub>4</sub>=5 ppm, MgCl<sub>2</sub>=15 ppm. Given Atomic weights Ca: 40, Mg:24, H:1, C:12, O:16, Cl:35.5, S:32  
(CO4) [Application]