*R22 Regulation* *Subject code: 4B2AD*

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

## B.Tech II Semester Supplementary Examinations, January 2024

## Applied Chemistry

*(Common to CE &EEE)*

***Maximum Marks: 60*** Date:29.01.2024 Duration: 3 hours

**Note:** **1.This question paper contains two parts A and B.**
**2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.**
**3. Part B consists of 5 Units. Answer any one full question from each unit.**
**4. Each question carries 10 marks and may have a, b, c, d as sub questions.**

| | | Part-A | CO | Bloom Tx |
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| All the following questions carry equal marks (10x1M=10 Marks) | | | CO1 | L1 |
| 1. | a | Define caustic embrittlement. | CO1 | L1 |
| | b | What are the units of hardness of water. | CO2 | L1 |
| | c | What is meant by Galvanic corrosion? | CO2 | L1 |
| | d | Write the anodic and cathodic reactions of methanol-oxygen fuel cell. | CO3 | L1 |
| | e | What are elastomers? | CO3 | L1 |
| | f | Write the preparation, properties and applications of Bakelite. | CO4 | L1 |
| | g | Define octane and cetane rating? | CO4 | L1 |
| | h | Write the Dulong's formula for calculation of HCV. | CO5 | L1 |
| | i | What is the composition of Portland cement? | CO5 | L1 |
| | | Part-B | | |
| Answer All the following questions. (5X10M=50Marks) | | | | |
| 2 | | a) What is reverse osmosis? What are the advantages of reverse osmosis. [5M]<br>b) Write a note on scales & sludges. [5M] | CO1 | L2<br>L2 |
| | | OR | | |
| 3 | | a) Explain EDTA method of estimation of temporary and permanent hardness of water. [5M]<br>b) Calculate the amount of permanent and temporary hardness of water sample which contains following impurities. Mg (HCO3)2 =7.3mg/L, Ca (HCO3)2 = 16.2mg/L, MgCl2= 9.5mg/L and CaSO4=13.6mg/L. [5M] | CO1 | L2<br>L3 |
| 4 | | a) Explain the construction and working principle of Lithium-ion battery. [5M]<br>b) What are the factors affecting the rate of corrosion. [5M] | CO2 | L2<br>L2 |
| | | OR | | |
| 5 | | a) What are the controlled methods involved in Corrosion. [5M]<br>b) Write about the theories of chemical and electrochemical corrosion. [5M] | CO2 | L2<br>L2 |
| 6 | | a) Describe briefly about natural rubber and its vulcanization process. [5M]<br>b) Differentiate between addition and condensation polymerization. [5M] | CO3 | L2<br>L2 |

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|---|---|---|---|
| | OR | | |
| 7 | a) Describe briefly about conducting polymers. [5M]<br>b) Write the preparation, properties and applications of a) PVC and b) Teflon [5M] | CO3 | L2<br>L2 |
| 8 | a) Explain about refining of petroleum with the neat diagram. [5M]<br>b) Calculate the gross and net calorific value of a coal sample having the following: [5M]<br>Composition C = 80 %, H = 7 %, O = 3 %, S = 3.5 %, N = 2 %, and ash = 5 %. | CO4 | L2<br>L3 |
| | OR | | |
| 9 | a) What is cracking and explain types of cracking with diagrams. [5M]<br>b) Explain about the preparation of Bio-diesel by transesterification. [5M] | CO4 | L2<br>L2 |
| 10 | a) What do you mean by setting and hardening of cement and explain the steps involved with the help of chemical equations. [5M]<br>b) What are the characteristics of a good refractory. [5M] | CO5 | L2<br>L2 |
| | OR | | |
| 11 | a) What is a lubricant? Explain the mechanism of lubricant. [5M]<br>b) Write the classification of lubricants with examples. [5M] | CO5 | L2<br>L2 |