**Department of H&S**

**B. Tech Mid Question Bank (R22 Regulation)**

**Academic Year: 2024-2025**

**Semester : I**

**Subject Name: Engineering Chemistry**

**Subject Code: 22CH102BS**

**Faculty Name: Dr. C. Amaravathi**

## PART-A

| Q. No | Questions | Marks | BL | CO | Unit No |
|---|---|---|---|---|---|
| 1 | Which salts are responsible for the temporary & permanent hardness of water? | 2 | L1 | CO1 | I |
| 2 | Mention the common units used for expressing hardness of water. | 2 | L2 | CO1 | I |
| 3 | If the hardness of water sample is 14 degree Clark, what is the hardness in terms of ppm? | 2 | L1 | CO1 | I |
| 4 | What is calgon calgon conditioning? | 2 | L3 | CO1 | I |
| 5 | What is sedimentation, and coagulation? | 2 | L3 | CO1 | I |
| 6 | Define reverse osmosis. | 2 | L1 | CO1 | I |
| 7 | What is a polymer? | 2 | L1 | CO2 | II |
| 8 | Differentiate between home & co- polymers. | 2 | L2 | CO2 | II |
| 9 | What is an elastomer? | 2 | L1 | CO2 | II |
| 10 | Why natural rubber needs vulcanization? | 2 | L4 | CO2 | II |
| 11 | How Nylon 6:6 is produced? | 2 | L3 | CO2 | II |
| 12 | What are biodegradable polymers? | 2 | L1 | CO2 | II |
| 13 | What are batteries? | 2 | L1 | CO3 | III |
| 14 | Distinguish between primary and secondary battery. | 2 | L2 | CO3 | III |
| 15 | What are reserve batteries? Give examples | 2 | L1 | CO3 | III |
| | **UPTO MID-1** | | | | |
| 16 | What is Pilling–Bed worth rule? | 2 | L1 | CO3 | III |

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| 17 | What is electrochemical corrosion? Give example. | 2 | L1 | CO3 | III |
| 18 | Define tinning. | 2 | L1 | CO3 | III |
| 19 | Define a fuel. | 2 | L1 | CO4 | IV |
| 20 | Explain Dulong's formula. | 2 | L2 | CO4 | IV |
| 21 | Define gross and net calorific value of a fuel. | 2 | L1 | CO4 | IV |
| 22 | What is meant by octane number of a gasoline? | 2 | L2 | CO4 | IV |
| 23 | What is knocking? | 2 | L1 | CO4 | IV |
| 24 | List out the applications of natural gas. | 2 | L1 | CO4 | IV |
| 25 | Define Portland cement and write its composition. | 2 | L1 | CO5 | V |
| 26 | Define lubricants. | 2 | L2 | CO5 | V |
| 27 | Define viscosity and discuss its variation with temperature. | 2 | L1 | CO5 | V |
| 28 | What is cloud and pour point of a lubricant? | 2 | L1 | CO5 | V |
| 29 | Give the applications of PLA. | 2 | L3 | CO5 | V |
| 30 | What are thermo responsive materials? | 2 | L1 | CO5 | V |

## PART-B

| Q .No | Questions | Marks | BL | CO | Unit No |
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| 1 | What are boiler troubles? Explain the following.<br>a) Scales and sludge's b) Caustic embrittlement | 8 | L2 | CO1 | I |
| 2 | Explain EDTA method to estimate the hardness of given water sample. | 4 | L2 | CO1 | I |
| 3 | Explain the steps involved in treatment of potable water. | 8 | L2 | CO1 | I |
| 4 | Explain different types of internal treatment methods (conditioning) of water. | 4 | L2 | CO1 | I |
| 5 | A sample of hard water contains 14.6 gm Mg(HCO3)2 and 9.5 gm of MgCl2 and 13.6 gm of CaSO4. Calculate the temporary, total and permanent hardness of the Water sample. | 4 | L4 | CO1 | I |
| 6 | What is potable water? Explain different types of disinfection methods of potable water. | 4 | L1 | CO1 | I |

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| 7 | Discuss the ion exchange process with neat diagram and give its merits. | 8 | L3 | CO1 | I |
| 8 | Define Deflouridation? Explain the removal of fluoride ion by Nalgonda technique? | 4 | L1 | CO1 | I |
| 9 | Explain Reverse osmasis. | 4 | L2 | CO1 | I |
| 10 | Define polymer? Write the classification of polymers? | 4 | L1 | CO2 | II |
| 11 | Give the preparation, properties and applications:<br>a) Buna-Sb) Thiokol rubber | 4 | L2 | CO2 | II |
| 12 | What is natural rubber and explain vulcanization of natural rubber? | 4 | L1 | CO2 | II |
| 13 | Give the preparation, properties and application of the Buna-S, Thiokol rubber. | 4 | L2 | CO2 | II |
| 14 | What is natural rubber and explain vulcanization of natural rubber? | 4 | L1 | CO2 | II |
| 15 | Explain biodegradable polymer? Give preparation, properties and application of biodegradable polymer. | 4 | L2 | CO2 | II |
| 16 | Define polymerization. Explain mechanism of free radical addition polymerization. | 8 | L2 | CO2 | II |
| 17 | Give the preparation, properties and applications of the following<br>a)PVC b) Bakelite | 8 | L2 | CO2 | II |
| 18 | What is meant by conducting polymers and Explain the conducting mechanism of polyacetylene. | 8 | L1 | CO2 | II |
| 19 | Define primary batteries. Discuss the construction, working and applications of lithium cells. | 4 | L2 | CO3 | III |
| 20 | What are secondary batteries? Explain the construction, working and applications of lithium-ion cells. | 4 | L2 | CO3 | III |
| 21 | What are reserve batteries? Explain the working and applications of zinc air battery. | 4 | L2 | CO3 | III |
| 22 | Describe the working of methanol-oxygen fuel cells with applications. | 4 | L2 | CO3 | III |
| 23 | Explain the applications of lithium ion batteries. | 4 | L2 | CO3 | III |
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# UPTO MID1

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| 24 | Define wet corrosion. Explain the mechanism of wet Corrosion. | 4 | L2 | CO3 | III |
| 25 | Explain the factors affecting rate of corrosion. | 4 | L2 | CO3 | III |
| 26 | What is cathodic protection? Explain how metals are protected by Sacrificial and impressed current methods. | 4 | L2 | CO3 | III |
| 27 | Explain the following<br>a) Galvanization b) Tinning | 4 | L2 | CO3 | III |
| 28 | Explain the electroplating. | 4 | L2 | CO3 | III |
| 29 | Explain the proximate and ultimate analysis of coal in detail. | 8 | L2 | CO4 | IV |
| 30 | Explain refining of petrol with neat diagram. | 4 | L2 | CO4 | IV |
| 31 | Define cracking of petrol. Describe moving bed catalytic cracking with a neat labelled diagram. | 8 | L2 | CO4 | IV |
| 32 | What is synthetic petrol? Explain Fischer-Tropsch process for synthetic petrol. | 8 | L2 | CO4 | IV |
| 33 | Discuss the characteristics of a good fuel. | 4 | L2 | CO4 | IV |
| 34 | Write a short note on biodiesel and advantages. | 4 | L2 | CO4 | IV |
| 35 | Write a short note on biodiesel and advantages. | 4 | L2 | CO4 | IV |
| 36 | Discuss the composition and characteristics of natural gas, LPG and CNG in detail. | 4 | L4 | CO4 | IV |
| 37 | Discuss about the natural gas, LPG and CNG in detail. | 4 | L4 | CO4 | 1V |
| 38 | What are smart materials? Explain its applications. | 4 | L1 | CO5 | V |
| 39 | Write the preparation, properties and applications of the following:<br>a. PVA (Poly Vinyl Amide)<br>b. PLA (Poly Lactic Acid) | 4 | L2 | CO5 | V |
| 40 | What are Thermo responsive materials? Explain about LCST and UCST Polymers | 4 | L1 | CO5 | V |
| 41 | Define lubricant and discuss its classification with examples. | 4 | L1 | CO5 | V |

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| 42 | What are Portland cement and its composition? Explain setting and hardening of cement with suitable reactions. | 8 | L1 | CO5 | V |
| 43 | Write the preparation, properties and applications of the following:<br>a) PLA b) PAA | 8 | L2 | CO5 | V |
| 44 | Write a short note on shape memory materials. | 4 | L2 | CO5 | V |
| 45 | Explain the properties of a lubricants. | 4 | L2 | CO5 | V |
| 46 | Explain the following mechanisms of lubrication?<br>a) Thin film b) Thick film c) Extreme pressure | 8 | L2 | CO5 | V |