

B.Tech. I Year II Sem. – I MID MODEL QUESTIONS
Subject: Engineering Chemistry

PART-A

- 1) Define specific and equivalent conductance and give their units
- 2) The equivalent conductance at 25 °C of a deci normal solution of acetic acid is 5.0 S cm²eq⁻¹. At infinite dilution equivalent conductance is 390 S cm² eq⁻¹. Calculate the degree of ionization of acetic acid at this dilution.
- 3) 0.5 N MgSO₄ solution is placed between two platinum electrodes 20 cm apart and 4 cm² area has a resistance of 125 ohm. Calculate equivalent conductance of the solution
- 4) What is meant by sacrificial anode?
- 5) State Pilling-Bedworth rule
- 6) What is Impressed current cathodic protection?
- 7) What is meant by Caustic Embrittlement?
- 8) Mention various units of Hardness of water.
- 9) How dissolved oxygen can be removed from boiler feed water?
- 10) How temporary hardness differs from permanent hardness?
- 11) Why hardness is expressed in terms of calcium carbonate equivalents?
- 12) What is Reverse Osmosis?
- 13) What is break point chlorination?
- 14) Define a fuel?
- 15) Arrange various forms of coal as per their rank
- 16) What are the characteristics of a good coal?

PART-B

1. a) What is glass electrode? How do you measure the pH of an acidic solution by making use of glass electrode?
b) Give a brief account on Lead-Acid battery.
2. a) Explain construction and working of Saturated calomel electrode.
b) Briefly explain about Hydrogen-Oxygen Fuel Cell.
3. a) State and explain Kohlrausch's law. What are the applications of the law?
b) Give a brief account on Nickel-Cadmium battery
4. a) Write a note on factors influencing rate of corrosion.
b) Describe in brief (i) Galvanizing and (ii) Electroplating
5. a) Explain mechanism of electrochemical corrosion in neutral medium.
b) Write a Short note on the following
(i) Metal Cladding (ii) Sacrificial Anodic Protection

6. a) Write a note on (i) Tinning (ii) Electrolessplating
b). Explain in brief the “Electroplating of copper”.
7. a) Explain any two methods of internal conditioning of hardwater.
b) Calculate the amounts of lime and soda required for softening 15,000 Litres of water containing the salts $\text{Ca}(\text{HCO}_3)_2 = 16.2 \text{ mg/L}$, $\text{Mg}(\text{HCO}_3)_2 = 14.6 \text{ mg/L}$, $\text{MgCl}_2 = 9.5 \text{ mg/L}$, $\text{CaSO}_4 = 13.6 \text{ mg/L}$.
8. a) How hard water is softened by Zeolite method? Explain with neat diagram
b) Calculate the amount of lime and soda required for the treatment of 10000 Litres of raw water containing the following dissolved salts per litre. $\text{Ca}(\text{HCO}_3)_2 = 16.2 \text{ mg}$, $\text{MgCl}_2 = 19 \text{ mg}$, $\text{CaCl}_2 = 11.1 \text{ mg}$, and $\text{MgSO}_4 = 12 \text{ mg}$.
9. a) Describe Ion exchange method for softening of water.
b) Calculate the amount of lime and soda required for softening 50,000 Litres water containing the following dissolved salts per litre. $\text{Ca}(\text{HCO}_3)_2 = 12.1 \text{ mg}$, $\text{Mg}(\text{HCO}_3)_2 = 11.6 \text{ mg}$, $\text{MgCl}_2 = 7.9 \text{ mg}$, $\text{CaSO}_4 = 10.2 \text{ mg}$.
10. a) Explain how hardness of water is determined by EDTA method.
b) Write a short note on Electrodialysis.
11. a) Write a brief account on priming and foaming..
b) What are the steps involved in obtaining potable water?
12. a) Explain the formation of scales and sludges in boilers. What are their bad effects?
b) What is desalination? Explain various methods available for desalination?
13. a) Explain the classification of fuels with suitable examples.
b) How the coal is analyzed by Ultimate analysis method?
14. a) What are the characteristics of a good solid fuel?
b) Explain Proximate analysis of coal with significance.
15. a) How fuels are classified? Give suitable examples.
b). Explain Ultimate analysis of coal with significance
16. a) What are the characteristics of a good fuel?
b) Explain Proximate analysis of coal with significance.
17. a) Explain about Ultimate analysis of coal and write its significance.
b) What are the characteristics of different grades of coal?
