

Engineering Chemistry Question bank B. Tech.

Unit-Water & Methods of analysis

Marks-2

1. Define hardness of water. What are the two types of hardness?
2. Give any two units of hardness of water.
3. Draw the structure of M-EDTA complex.
4. Draw the structure of disodium salt of ethylenediamine tetraacetic acid.
5. Define scale and sludge.
6. Define priming and foaming.
7. What is caustic embrittlement?
8. What types of salts are present in permanent hard water?
9. What types of salts are present in temporary hard water?
10. Distinguish between scales and sludges.
11. Give the reaction of boiling of hard water contain $\text{CaH}(\text{CO}_3)_2$
12. Define chromatography. What is its principle?

Marks-7/8

1. Explain the method of determination of hardness of water by EDTA titration.
2. What is ion exchange process? Explain with diagram.
3. Explain phosphate conditioning method.
4. Explain the factors responsible for the corrosion of a boiler.
5. Calculate the temporary and permanent hardness of water sample containing $\text{Mg}(\text{HCO}_3)_2 = 7.3\text{mg/L}$, $\text{Ca}(\text{HCO}_3)_2 = 16.2\text{mg/L}$, $\text{MgCl}_2 = 9.5\text{mg/L}$, $\text{CaSO}_4 = 13.6\text{mg/L}$
6. Calculate the temporary and total hardness of a water sample containing $\text{Mg}(\text{HCO}_3)_2 = 73\text{mg/L}$, $\text{Ca}(\text{HCO}_3)_2 = 162\text{mg/L}$, $\text{MgCl}_2 = 95\text{mg/L}$, $\text{CaSO}_4 = 136\text{mg/L}$.
7. Explain the technique of TLC. Give its applications.
8. Explain the technique of paper chromatography. Give its applications.

Unit-Fuels and Batteries

Marks-2

1. What are fuels? Give its classification.
2. Define calorific value?
3. Define gross and net calorific value.
4. What do you mean by proximate analysis?
5. What do you mean by ultimate analysis?
6. Define knocking. Enlist any two antiknocking agents.
7. Define octane and cetane number.
8. What do you mean by battery and cell? What are the different types of batteries?
9. Define primary and secondary battery.
10. What is fuel cell?

Marks-7/8

1. Give the significance of ultimate analysis.
2. Give the significance of proximate analysis.
3. How will you determine the amount of C and H present in coal sample? Explain.
4. How will you determine the amount of moisture and ash present in coal sample? Explain.
5. How will you determine the amount of N and S present in coal sample? Explain.
6. What is fractional distillation? Explain the distillation of crude oil by fractional distillation method.
7. Distinguish between octane and cetane number.
8. What is producer gas? Explain the method of preparation of producer gas with neat labeled diagram.
9. Explain phosphoric acid fuel cell (PAFC) with neat labeled diagram.
10. What is secondary battery? Explain lead acid storage battery with charging and discharging reactions.

Unit- Lubricants & Green Chemistry

Marks-2

1. Define lubricant. What is its classification?
2. What are the different types of mechanism of lubrication?

3. Give the properties and uses of graphite.
4. Give the properties and uses of grease.
5. Define viscosity and viscosity index.
6. Define pour point and cloud point.
7. Define fire point and flash point.
8. What do you mean by acid value of lubricant?
9. Define green chemistry.

Marks-7/8

1. Explain the mechanism of lubrication with diagram- fluid film lubrication.
2. Explain the mechanism of lubrication with diagram- Boundary lubrication.
3. Explain the principles of green chemistry.
4. Explain CO₂ as super critical fluid/solvent.

Unit- Engineering materials

Marks-2

1. Define Thermoplastics and thermosetting polymers.
2. Give properties and application of PVC.
3. Give properties and application of Bakelite.
4. What are Biodegradable polymers? What are its properties & applications?
5. Give properties and application of polyvinyl acetate.
6. What do you mean by thermal insulating materials?
7. Define thermacol. Give its properties and applications.
8. Define glass wool. Give its properties and applications.
9. What is cement? What is its composition?
10. What do you mean by setting and hardening of cement.
11. What are refractories? Give its properties and applications.
12. What are types of refractories?

Unit- Corrosion

Marks-2

1. Define corrosion. What is dry and wet corrosion?
2. What is pitting and intergranular corrosion?
3. What is stress corrosion?
4. What are disadvantages of corrosion?
5. What is oxide layer formation on metal? What are its different types?
6. What is sacrificial anodic protection?
7. What is impressed current cathodic protection?

Marks7/8

1. Explain the role of design and material selection in corrosion control.
2. Explain the mechanism of wet corrosion.
3. Explain the mechanism of dry corrosion.
4. What do you mean by cathodic protection? Explain with mechanism.
5. What is hot dipping? Explain galvanizing with neat labeled diagram.
6. What is hot dipping? Explain tinning with neat labeled diagram.
7. Explain electrochemical corrosion with diagram.
8. Distinguish between galvanizing and tinning.

Unit- Alloys & Phase Rule

Marks-2

1. Define alloys. What is purpose of alloying metal?
2. Give the composition, properties and applications of Alnico.
3. Give the composition, properties and applications of Duralumin.
4. Give the composition, properties and applications of Gun metal.
5. State Gibbs Phase rule.
6. State reduced phase rule.
7. Define component, degrees of freedom, phase.

Marks-7/8

1. Explain water system as a one component system with neat labeled diagram.
2. Explain lead- tin system as a two component system with neat labeled diagram.

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