

- 3 a. Choose your answers for the following : (04 Marks)
- In galvanic corrosion the less active metal always acts as

A) Anode	B) Cathode
C) Both anode and cathode	D) none of these
 - Caustic embrittlement of boilers is due to presence of excess of

A) Na_2CO_3	B) $\text{Ca}(\text{OH})_2$
C) CaSO_4	D) CaCO_3
 - In differential aeration corrosion the area more accessible to air acts as

A) Cathode	B) Anode
C) Anode and Cathode	D) None of these
 - Electrolyte used in anodizing of aluminium is

A) H_2SO_4	B) KOH
C) NH_4Cl	D) HCl
- b. Explain the following types of corrosion i) Galvanic corrosion ii) Stress corrosion. (06 Marks)
- c. What is anodizing? Explain the anodizing of aluminum. (05 Marks)
- d. What are corrosion inhibitors? Explain how corrosion is controlled by inhibitors. (05 Marks)
- 4 a. Choose your answers for the following : (04 Marks)
- The process in which the metal ions are deposited on catalytically active surface in presence of reducing agent is

A) Electroplating	B) Electroless plating
C) Immersion plating	D) Electrophoretic painting
 - In electroplating of chromium the anode used is

A) Achromium	B) Pb – Sb alloy
C) Nickel	D) Copper
 - Concentration of metal ions in plating bath is reduced by addition of

A) Brighteners	B) Levellers
C) Complexing agent	D) All the above.
 - Reducing agent used in electroless Nickel plating is

A) Formaldehyde	B) Sodium Acetate
C) Sodium hypophosphite	D) Sodium succinate.
- b. What is electroplating? What are the advantages of electroless plating over electroplating? (04 Marks)
- c. Explain the process of electroless plating of Nickel on aluminum. (06 Marks)
- d. Discuss the chromium plating process. (06 Marks)

PART – B

- 5 a. Choose your answers for the following : (04 Marks)
- Quality of Gasoline is expressed in terms of its

A) Octane number	B) Cetane number
C) Compression ratio	D) Compression number
 - In fluidized bed catalytic cracking process, the cracking of heavy oil takes place at

A) 200 - 300°C	B) 500 - 600°C
C) 1000 - 1200°C	D) 1500°C
 - Methyl tertiary butyl ether is added to petrol which acts as

A) Inhibitor	B) Accelerator
C) Ant knocking agent	D) Catalyst
 - Catalysts used in catalytic converter is

A) Pt, Pd and Rh	B) Ni, Co and Cr
C) SiO_2 and Al_2O_3	D) Zeolite
- b. What is knocking? Explain its mechanism. (06 Marks)
- c. Explain the construction and working of photovoltaic cell. (04 Marks)
- d. What is biodiesel? Explain the biodiesel production by transesterification of triqulyceride. (06 Marks)

- 6 a. Choose your answers for the following : (04 Marks)
- In potentiometric redox titrations platinum electrode is used in combination with
 - SHE
 - Calomel electrode
 - NHE
 - None of these
 - Condensed phase rule is applied for a system consisting of :
 - Two component
 - One component
 - Multi component
 - Three component
 - Lambert's law states that intensity of monochromatic light decrease exponentially with
 - Concentration
 - Path length
 - Time
 - Density
 - In flame atomic emission spectroscopy the emitted radiation lies in
 - Visible range
 - IR range
 - UV range
 - None of these
- b. Define the terms phase, component and degree of freedom and explain the application of phase rule to water system. (08 Marks)
- c. What is the principle of flame photometry? What are the processes that occur in the flame? Explain the various components of flame photometer. (08 Marks)
- 7 a. Choose your answers for the following : (04 Marks)
- Addition polymerization is also called
 - Step polymerization
 - Chain polymerization
 - Condensation polymerization
 - none of these
 - Natural rubber is polymerized form of
 - Isoprene
 - Propene
 - Butene
 - Styrene
 - Free radicals are reactive species having
 - Paired electrons
 - Unpaired electrons
 - Anions
 - Cations
 - Glass transition temperature of polymer is
 - First order transition
 - Second order transition
 - Third order transition
 - Multiorde transition
- b. Explain the free radical mechanism of addition polymerization taking ethylene as a monomer. (05 Marks)
- c. Explain the manufacture of plastics by injection moulding process. (05 Marks)
- d. What are polymer composites? Write a note on Kevlar fibre. (06 Marks)
- 8 a. Choose your answers for the following : (04 Marks)
- Temporary hardness of water is due to
 - $\text{Ca}(\text{HCO}_3)_2$ and $\text{Mg}(\text{HCO}_3)_2$
 - CaCl_2
 - CaSO_4
 - MgSO_4
 - Potassium chromate is used as an indicator in analysis of water
 - Hardness
 - Alkalinity
 - Chloride
 - Fluoride
 - Brackish water can be desalinated by
 - Electrodialysis
 - Reverse Osmosis
 - Filtration
 - both A and B
 - The method adopted to analyze dissolved oxygen in water is
 - Volhards
 - Winkers
 - Argentometric
 - Dumas
- b. What is alkalinity of water? Explain the determination of alkalinity of water. (06 Marks)
- c. 20 ml of sample of COD analysis was reacted with 10 ml of 0.25 N $\text{K}_2\text{Cr}_2\text{O}_7$ and the unreacted dichromate required 6.5 ml of 0.10 N Ferrous ammonium sulphate. 10 ml of same $\text{K}_2\text{Cr}_2\text{O}_7$ and 20 ml of distilled water under the same conditions as the sample required 26.0 ml of 0.10 NFAS. What is the COD of the sample? (04 Marks)
- d. What is desalination? Explain the desalination of water by electrodialysis. (06 Marks)