

**B.E DEGREE EXAMINATIONS: DEC 2014**

(Regulation 2009)

Second Semester

**CHY103: APPLIED CHEMISTRY**

(Common to AERO/AUTO/MECH/MCT)

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

- Choose the composition of producer gas from the following
  - $\text{CO} + \text{H}_2 + \text{N}_2 + \text{CO}_2$
  - $\text{N}_2\text{O} + \text{NO} + \text{CO}_2 + \text{CO}$
  - $\text{H}_2\text{S} + \text{N}_2 + \text{CO}_2 + \text{CO}$
  - $\text{H}_2\text{S} + \text{H}_2 + \text{CO}_2 + \text{NO}$
- The amount of carbon, hydrogen and sulphur content in a coal can be estimated using
  - Fischer – Tropsch process
  - Proximate Analysis
  - Otto-Hoffmann's Method
  - Ultimate analysis
- The Moh's scale hardness of Corundum is
  - 5
  - 9
  - 8
  - 7
- Conradson's apparatus is used to find ----- of an oil
  - Viscosity index
  - Pour point
  - Carbon residue
  - Aniline point
- Pilling Bedworth rule is concerned with
  - Temperature of the oxide layer
  - Volume of the oxide layer
  - Density of the oxide layer
  - Colour of the oxide layer
- PVC stands for
  - Pigment vehicle concentration
  - Pigment volume concentration
  - Polymer volume concentration
  - Paint volume concentration
- Accumulation of caustic substances on the inner walls of the boiler causes
  - Caustic embrittlement
  - Priming
  - Sludge
  - Carry over phenomena



(ii) Debate on the important characteristics of refractory materials. (7)

**(OR)**

b) (i) Give an account of preparation of synthetic abrasives. (7)

(ii) Describe the flash point and fire point of lubricants. (7)

23. a) (i) Describe the mechanism of electrochemical corrosion by hydrogen evolution and oxygen adsorption method. (7)

(ii) Analyze the role of sacrificial anode method in the prevention of corrosion. (7)

**(OR)**

b) (i) Discuss and categorize the factors that affect electrochemical corrosion rate. (7)

(ii) Describe the mechanism of differential aeration corrosion taking pitting as an example. (7)

24. a) (i) Analyze the problems caused if scale and sludge formed in boilers during steam production. (7)

(ii) Discuss the principle and salient features of desalination of water by reverse osmosis. (7)

**(OR)**

b) (i) Explain the demineralization of water by ion-exchange process. How are exhausted cation and anion exchange resin regenerated? (7)

(ii) Narrate the steps involved in domestic water treatment with necessary flow chart. (7)

25. a) (i) Draw a neat labeled phase diagram of Pb – Ag system and explain eutectic formation. (7)

(ii) Define the term eutectic. Discuss the application of eutectic system in the field of engineering. (7)

**(OR)**

b) (i) Elaborate the merits and demerits of powder metallurgy. (4)

(ii) Explain in detail about the process involved in powder metallurgy. (10)

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