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Question Paper Code: **22113**

**B.E./B.Tech.Degree Examinations, April/May 2011
Regulations 2008**

Second Semester

Common to all branches (except Marine Engg)

CY2161 Engineering Chemistry II

Time: Three Hours

Maximum: 100 marks

Answer ALL Questions

Part A - (10 x 2 = 20 marks)

1. What *is* single electrode potential?
2. What *are* the advantages of conductometric titrations?
3. List out the differences (any four) between chemical corrosion and electrochemical corrosion.
4. What is a paint? Mention its constituents.
5. What *is* the difference between caking coal and coking coal?
6. Write the expression for *the* amount of air required for combustion of 1 kg fuel.
7. Mention any two merits of phase rule.
8. Give *the* composition and the main use of nichrome.
9. Mention any two applications of UV spectroscopy.
10. State two applications of AAS.

Part B - (5 x 16 = 80 marks)

11. (a) (i) Derive Nernst equation for the calculation of cell emf. Give its applications. (8)
- (ii) Explain the measurement of pH of a solution using glass electrode. Mention the advantage of this electrode. (8)

OR

11. (b) (i) What is electrochemical (or) EMF series? Give its applications with suitable examples. (8)
- (ii) Explain the principle involved in potentiometric titrations. Write an experimental procedure for carrying out the titration of a precipitation reaction. (8)
12. (a) (i) Explain the sacrificial anode and impressed current techniques for the prevention of corrosion. (8)
- (ii) What are the factors which influence chemical corrosion and electrochemical corrosion? (8)

OR

12. (b) (i) With reference to control of corrosion rate, explain (1) anodic inhibitors and (2) cathodic inhibitors. (6)
- (ii) How will you distinguish between electroplating and electroless plating? Write a detailed account on the activation of surface, overall reaction, electroless plating and favourable conditions of Nickel. (10)
13. (a) (i) Explain the ultimate analysis of coal. (6)
- (ii) Describe the Otto-Hoffmann method of coke manufacture and the recovery of various by-products. (10)

OR

13. (b) (i) Describe the manufacture of gasoline by Fischer-Tropsch method. (8)
- (ii) How is producer gas manufactured? State its composition and uses. (8)
14. (a) (i) What is the difference between critical point and triple point? 100 kg of a sample of argentiferous lead containing 0.5% Ag is melted and then allowed to cool. If eutectic contains 2.6% Ag, (1) what mass of eutectic will be formed and (2) what mass of lead will separate out? (6)
- (ii) Discuss the Pb-Ag system with a complete phase diagram. (10)

OR

14. (b) (i) What is the need for heat treatment of metals? What are its types? Elaborate any two treatment methods. (6)
- (ii) What is an alloy? What are the important characteristics of alloys? List out the composition, properties and applications of two types of Brass and two types of Bronze. (10)
15. (a) (i) Describe the various components of colorimeter and its working in detail. (8)
- (ii) Explain any four applications of IR spectroscopy with suitable examples. (8)

OR

15. (b) (i) Explain briefly the principle and instrumentation of flame photometer. (8)
- (ii) Give a neat sketch of AAS and describe the components. (8)