

B.E DEGREE EXAMINATIONS: APRIL / MAY 2011

Second Semester

CHY103: APPLIED CHEMISTRY

(Common to Aeronautical, Mechanical, Mechatronics Engineering)

Time: Three Hours

Maximum Marks: 100

Answer All Questions:-

PART A (10 x 1 = 10 Marks)

1. The percentage of carbon in anthracite Coal is
a) Above 50 b) above 60 c) above 80 d) above 90
2. The calorific value of natural gas is
a) 4000 K cal/m³ b) 6000 K cal/m³ c) 12000 – 14000 K cal/m³ d) above 15000 K cal/m³
3. The MOH's scale of hardness of diamond is
a) 10 b) 6 c) 4 d) 2
4. The followings polymers is a very good shock – proof material
a) Polycarbonate b) Thermocole c) polyurethane d) polyamide
5. The formula for rust is
a) Fe (OH)₃ b) Fe (OH)₂ c) Fe₂O₃ d) Fe₂So₄
6. The metal which is used as a sacrificial anode is
a) Ca b) Cr c) Zn d) Ni
7. The caustic embrittlement in water is due to the presence of
a) alkalinity b) acidity c) impurity d) salinity
8. Calgon is
a) Sodium hexameta phosphate b) Potassium hexameta phosphate
c) Sodium Phosphate d) Potassium Phosphate
9. The number of components present in the water system is
a) Zero b) One c) Two d) Three
10. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O} \rightleftharpoons \text{CuSO}_4 \cdot 3\text{H}_2\text{O} + 2 \text{H}_2\text{O}$
The number of components present in the above system is
a) Zero b) One c) Two d) Three

PART B (10 x 2 = 20 Marks)

11. What is octane number?
12. Define Net calorific value.

13. What is emery?
14. Define cloud and pour point.
15. Write any two differences between chemical and electrochemical corrosion.
16. Give any two methods to avoid Galvanic corrosion.
17. Write any four requirements of boiler feed water.
18. What is printing? How it can be avoided?
19. Define condensed phase rule.
20. Write any two limitations of powder metallurgy.

PART C (5 x 14 = 70 Marks)

21. a) Discuss in detail about the proximate and ultimate analysis of coal.

(OR)

- b) Explain the flue gas analysis by orsat method with neat diagram and significance.

22. a) (i) Write short notes on the following properties of refractories

a) Refractoriness under load b) Porosity (8)

(ii) Discuss the structure, Properties and uses of Graphite (6)

(OR)

- b) (i) Explain the following properties of lubricants with their significance.

a) Viscosity index b) oiliness (8)

(ii) What are artificial abrasives? Give a note on boron carbide (6)

23. a) (i) Discuss the various factors influencing the rate of corrosion (7)

(ii) Write a short note on pitting corrosion (7)

(OR)

- b) (i) Explain the process of electroplating of copper. (7)

(ii) Explain about differential aeration corrosion with examples. (7)

24. a) (i) How hard water is treated by ion exchange method. Discuss with neat diagram. (7)

(ii) How desalination is carried out by reverse osmosis process? (7)

(OR)

- b) (i) Discuss the various stages involved in the treatment of domestic water. (10)

(ii) Write short note on caustic embrittlement. (4)

25. a) (i) Discuss the phase diagram of lead – silver system with a neat diagram. (10)

(ii) List out the applications of phase rule. (4)

(OR)

b) (i) Explain the methods of preparation of metal powders. (10)

(ii) Write the advantages of powder metallurgy. (4)
