Register Number: …….

B.E. DEGREE EXAMINATIONS: NOV/DEC 2010

Second Semester

CIVIL ENGINEERING

CHY102: Chemistry for Civil Engineering

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. Hardness in water is caused by the presence of
   a) Sodium chloride b) Sodium carbonate c) Calcium chloride d) Potassium chloride

2. Colloidal conditioning of boiler water is done by using
   a) Calgon b) EDTA c) Ion exchangers d) lignin

3. During electrochemical corrosion in acidic environment,
   a) oxygen evolution occurs b) oxygen absorption occurs
   c) hydrogen evolution occurs d) hydrogen absorption occurs

4. When a portion of an iron rod is covered with cotton, after few days corrosion occurs at
   a) covered portion b) exposed portion c) both the portions d) no corrosion occurs

5. White Portland cement contains
   a) 1% ferric oxide b) 5% ferric oxide c) 10% ferric oxide d) no ferric oxide

6. Drying oils supply to paint film
   a) film forming constituent b) medium or vehicle c) water proofness d) All

7. Which one of the following is a whisker
   a) graphite b) boron carbide c) boron nitride d) silica

8. The electrical conductivity of thermocole is
   a) low b) high c) very low d) very high

9. The hardest material ever synthesized is
   a) diamond b) carborundum c) boron carbide d) calcium carbide

10. Which one of the following is a neutral refractory?
    a) dolomite bricks b) fireclay bricks c) silica bricks d) chromite bricks

PART B (10 x 2 = 20 Marks)

11. Why is carbonate hardness called temporary hardness?
12. What is wet steam? Mention the causes of its formation in boilers?
13. Define pitting corrosion. When does it occur?
14. Why does the steel tank containing water corrode below the waterline?
15. Why are cements called hydraulic cements?
16. What is slaked lime? Mention its use.
17. What are cermets? Give the composition of most commonly used cermet.
18. Distinguish between polymer blend and polymer alloy.
19. How does alundum differ from corundum?
20. What is meant by thermal spalling?

PART C (5 x 14 = 70 Marks)

21. (a) (i) Discuss the disadvantages of deposits in steam boilers. (7)

(ii) Give the various reactions that take place when hard water is treated using ion exchange resins. How are the resins regenerated? (7)

(OR)

(b) (i) Explain the method of hyper filteration of brackish water with a neat diagram. (7)

(ii) Give the flow chart for domestic water treatment. Explain the disinfection of water using bleaching powder and ozone. (7)

22. (a) (i) List out the differences between chemical and electrochemical corrosion. (7)

(ii) Explain contact corrosion with specific example. (7)

(OR)

(b) (i) Discuss the important factors that influence corrosion. (7)

(ii) What is meant by cathodic protection? Explain the sacrificial anodic method with a neat diagram. (7)

23. (a) (i) Write the chemical reactions that occur during setting and hardening of Portland cement and explain. (7)

(ii) What are special paints? Briefly explain three important special paints. (7)

(OR)

(b) (i) Write a note on weathering of cement and concrete. (7)

(ii) Give the mechanism of drying of conjugated and unconjugated oils of paints. (7)

24. (a) (i) What are FRP composites? Explain any two important types of it. (7)

(ii) List out the properties of polymer blends and alloys. (7)

(OR)

(b) (i) Discuss the important characteristics of composites. (7)

(ii) What are the properties and uses of polycarbonate and thermocole. (7)

25. (a) (i) Give the preparation , properties and uses of any two artificial abrasives. (7)

(ii) Discuss the importance of (i) oiliness (ii) viscosity and (iii) flash and fire point in selecting a lubricating oil for a particular use. (7)

(OR)

(b) (i) Discuss the properties and uses of high alumina and zirconia bricks. (7)

(ii) When are solid lubricants used? Explain the structure of any one solid lubricant. (7)

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