Register Number: ……………………

B.E DEGREE EXAMINATIONS: JUNE 2010

Second Semester

CHY103: APPLIED CHEMISTRY

(Common to B.E – Aeronautical Engineering, Mechanical Engineering, Mechatronics

Engineering)

Time: Three hours   **Maximum Marks: 100**

Answer ALL Questions

PART A (10 x 1 = 10 Marks)

1. Which one of the following possesses the highest calorific value?

   A. Lignite   B. Anthracite   C. Peat   D. Bituminous coal

2. Which one of the following has got maximum octane number?

   A. n-heptane   B. n-octane   C. Isooctane   D. n- hexadecane

3. Which of the following is an example for artificial abrasive?

   A. Diamond   B. Corundum   C. Quarts   D. Carborundum

4. An example for a solid lubricant is:

   A. calcium based grease   B. Sodium based grease

   C. Molybdenum sulphide   D. Lithium based grease

5. In which of the following, corrosion does not proceed rapidly?

   A. Bolt and nut made of the same metal   B. A steel pipe in a large copper tank

   C. A nail inside the wood   D. A steel screw in a brass marine hardware

6. In paints, which of the following is used to dissolve the film forming material?

   A. Drier   B. Thinner   C. Plasticizer   D. Extender

7. Which of the following is not a boiler compound?

   A. Sodium carbonate   B. Disodium hydrogen phosphate C. Sodium phosphate D. Alum

8. Fine suspended impurities present in water are removed by:

   A. Sedimentation   B. Sterilization   C. Coagulation   D. Filtration

9. The temperature at which two solid phases and one liquid phase are in equilibrium is
   called:

   A. Triple point   B. Eutectic point   C. Melting point   D. Freezing point

10. In Powder metallurgy, the process of completely filling the voids and inter connected
    porosities is called:

    A. Sizing   B. Infiltration   C. Coining   D. Impregnation

PART B (10 x 2 = 20 Marks)

11. Define the term knocking.

12. Distinguish between gross and net calorific values.

13. How are refractories classified? Give an example for each class.

14. Write any two functions of a lubricant.

15. How is galvanic corrosion minimized?

16. What are the functions of pigments in paints?

17. What is the role of calgon in the internal conditioning of boiler feed water?

18. What is meant by reverse osmosis?

19. What is a condensed system?

20. Define the term Powder Metallurgy.

PART C (5 x 14 = 70 Marks)

21. a) (i) How is ultimate analysis of coal carried out? (7)

    (ii) Describe the determination of calorific value of coal by Bomb calorimeter. (7)

(OR)

  b) (i) Describe the manufacture, average composition and uses of producer gas. (7)

    (ii) Describe, with a neat diagram, the fixed-bed catalytic cracking method

      of obtaining petrol. (7)

22. a) (i) Write briefly on the preparation and applications of silicon carbide and boron

      carbide. (7)

    (ii) Explain the importance of the properties of Refractoriness under Load and

      Dimensional stability. (7)

(OR)

  b) (i) Write briefly on Viscosity Index and Aniline point as applied to lubricants. (7)

    (ii) Illustrate polymer alloys with two examples. (7)

23. a) (i) Describe the mechanism of electrochemical corrosion. (7)

    (ii) Discuss the process of electroplating of copper. (7)

(OR)

  b) (i) Discuss the various environmental related factors influencing corrosion. (7)

    (ii) Illustrate the control of corrosion by the use of sacrificial anodes, with suitable

      examples. (7)

24. a) (i) Write briefly on priming and foaming in boiler feed water. (7)

   (ii) Describe, with a neat diagram, the ion-exchange method of water softening. (7)

(OR)

   b) (i) Discuss the ill-effects of boiler scales. (7)

   (ii) Write briefly on caustic embrittlement. (7)

25. a) (i) State the phase rule and explain the terms involved. (7)

   (ii) Explain the mechanical pulverization and automation methods of preparing metal powders. (7)

(OR)

   b) (i) Describe the construction of phase diagram by thermal analysis. (7)

   (ii) Explain the advantages and limitations of powder metallurgy. (7)

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