Register Number.....

B.E. DEGREE EXAMINATIONS: NOVEMBER 2009

Second Semester

U07CY203: CHEMISTRY- II

(Common to Aeronautical Engineering, Mechanical Engineering and Mechatronics Engineering)

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

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

1. The one of the catalysts used in Bergius process is

   A. Calcium carbide B. Finely powdered nickel C. Nickel oleate D. Nickel oxalate

2. The calorific value of water gas is

   A. 2800 k.cal/m^3 B.1300 k.cal/m^3 C.1500 k.cal/m^3 D.2300 k.cal/m^3

3. The following is a natural abrasive

   A. Carborundum B. Corundum C. Boron carbide D. Alundu

4. Viscosity index is the rate at which the viscosity of lubricating oil changes with

   A. Reaction B. Rise in temperature C. Lowering of temperature D. Pressure

5. During electrochemical corrosion in acidic environment

   A. Oxygen evolution occurs B. Oxygen absorption occurs

   C. Hydrogen evolution takes place D. Hydrogen absorption takes place

6. Non-volatile, film-forming constitute of a paint is called

   A. Drier B. Pigment C. Thinner D. Drying oil

7. Calgon is the trade name of

   A. Sodium phosphate B. Sodium dihydrogen phosphate

   C. Sodium hexameta phosphate D. Calcium phosphate

8. Cation and anion resins are made up of the basic polymer unit of

   A. PVC B. Polyacrylate C. Polystyrene D. Polysulfone

9. For binary alloy system (C=2) with a single phase (P=1), the degree of freedom is

   A.1 B. 2 C. 0 D. 3

10. Fullerenes contains

    A. Carbon 100 B. Carbon 10 C. Carbon 60 D. Carbon 50

PART B (10 x 2 = 10 Marks)

11. Define octane number of a petrol. How can it be improved?

12. Give the composition and uses of compressed natural gas.

13. What is meant by refractoriness under-load?

14. What is polymer alloy? Give examples.

15. What is pitting corrosion?

16. Write any two important functions of vehicle in a paint.

17. Soft water is not demineralised water whereas demineralised water is soft water. Justify.

18. What is meant by caustic embrittlement? How is it prevented?

19. What are the applications of phase rule?

20. State any two limitations of powder metallurgy.

PART C (5x14 = 70 Marks)

21. (a) (i) Describe the proximate analysis of coal and its significance.

(ii) Explain Fischer – Tropsch process.

(OR)

(b) (i) Describe the Otto-Hoffman's method of coke manufacture and the recovery of various by-products.

(ii) How is producer gas manufactured? State its composition and uses.

22. (a) (i) Describe the manufacture, characteristics and applications of zirconia and magnesite bricks.

(ii) Write a note on greases.

(OR)

(b) (i) Define and classify abrasives with examples.

(ii) Give the preparation, properties and uses of polycarbonates and polyurethanes.

23. (a) (i) Explain galvanic and stress corrosion.

(ii) What are the important constituents of paint? Explain their functions with examples.

(OR)

(b) (i) How may buried pipelines be prevented from corrosion?

(ii) Write a note on electroplating of copper.

24. (a) (i) Describe demineralisation process of water softening.

(ii) Outline the various stages of domestic water treatment in sequence.

(OR)

(b) (i) Discuss the causes and prevention of priming and foaming.

(ii) Discuss desalination by reverse osmosis process.

25. (a) (i) Draw and explain the phase diagram of Pb-Ag system.

(ii) Explain the principle and block diagram of AFM.

(OR)

(b) (i) How is phase diagram constructed from thermal analysis data?

(ii) Describe the chemical and electrochemical processes for the production of metal powders.

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