B.E. / B.TECH. DEGREE EXAMINATIONS: OCTOBER/NOVEMBER – 2008

Second Semester

U07CY203 CHEMISTRY II

(Common to Aeronautical, Mechanical and Mechatronics Engineering Branches)

Time: Three Hours   Maximum Marks: 100

Answer ALL Questions:-

PART A (20 X 2 =40 Marks)

1. Analysis of flue gas is done by

   A) Boy's gas calorimeter   B) Orsat apparatus

   C) Bee-hive oven   D) Bomb calorimeter

2. Which of the following is a biogas?

   A) Producer gas   B) Natural gas   C) Water gas   D) Coal gas

3. Producer gas is a mixture of

   A) $CO + H_2$ B) $CH_4 + H_2$ C) $CO + N_2$ D) $CO + CH_4$

4. An example of a primary fuel is

   A) Natural gas   B) Petrol   C) Wood charcoal   D) Coke

5. Porosity in a refractory brick generally increases

   A) pH   B) resistance to spalling   C) strength   D) melting point

6. Machines operating under high temperature and loads are best lubricated by

   A) Animal oil   B) Greases   C) Mineral oils   D) Solid lubricants

7. Oiliness is least in case of

   A) Greases   B) Animal oils C) Mineral oils   D) Palm oil

8. Foamed-plastic, obtained by blowing air / gas through molten polystyrene or

   polyurethane is

   A) Thermocole   B) Bakelite   C) Nylon   D) Teflon

9. During electrochemical corrosion in acidic environment

   A) N_2 evolution occurs   B) O_2 evolution occurs

   C) O_2 absorption occurs   D) H_2 evolution takes place

10. _____is a localized accelerated attack resulting in the formation of cavities around which

the metal is relatively unattached

   A) Pitting corrosion   B) Stress corrosion

   C) Soil corrosion   D) Differential aeration corrosion

11. Non-volatile, film-forming constituent of a paint is called

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

12. When a buried pipeline is protected from corrosion by connecting to Mg block, it is called

A) Sacrificial cathodic protection   B) Impressed current protection

C) Sacrificial anodic protection   D) Electrolysis

13. Which of the following is not correct?

A) Hardness of water depends on its soap consumption.

B) Temperarory hardness is due to bicarbonates of Ca and Mg.

C) Permanent hardness is due to soluble SO_4^{2-} and Cl^- of Ca and Mg.

D) Permanent hardness can by removed by boiling.

14. Disinfection of water removes

A) Hardness   B) Turbidity   C) Bacteria   D) Odour

15. The exhausted zeolite can be regenerated by passing through it a concentrated solution of

A) $CaCl_2$ B) $ZnCl_2$ C) $MgCl_2$ D) NaCl

16. Water matching distilled water can be obtained by

A) Permutit process   B) Boiling

C) Lime – Soda process   D) Ion – exchange resins.

17. A system consisting of O_2 and N_2 gases is

A) One phase system   B) Two phase system

C) Three phase system   D) Zero phase system

18. Which of the following is condensed phase rule equation?

A) $F = C - P + 1$ B) $F = C - P + 3$

C) $C = F - P + 3$ D) $F = C - P + 2$

19. The process of heating the green compact to a temperature below the sintering temperature is

A) Presintering   B) Atomization

C) Chemical reduction   D) Compacting

20. Nano means

A) One billionth   B) One hundredth

C) One thousandth   D) Very large

PART – B (5 X 12 = 60 Marks)

21. a) i) Explain the proximate analysis of coal. (6)

  ii) How will you obtain synthetic petrol by Fischer -- Tropsch's method?

  Explain. (6)

(OR)

21. b) i) Explain the production and uses of water gas. (6)

  ii) What is flue gas? How is it analysed using Orsat's apparatus? (6)

22. a) i) What are abrasives? Give the preparation and properties of any two

  abrasives. (6)

  ii) Give one method of preparation for:

    1. Polycarbonates   2. Polyamides (6)

(OR)

22. b) i) Explain the importance of the following properties of refractory materials

    1. Refractoriness   2. Dimensional Stability (6)

  ii) Discuss the importance of

    1. Flash and Fire point and

    2. Cloud and pour point in the selection of liquid lubricants. (6)

23. a) i) Explain the differential aeration corrosion. Illustrate with an example. (6)

  ii) With a neat sketch explain sacrificial anodic protection method of

  corrosion control. (6)

(OR)

23. b) i) What are the different constituents of a paint? Explain their functions. (6)

  ii) Describe the theory of electroplating of copper. (6)

24. a) i) Discuss briefly the scale formation in boilers and methods adopted for

  removal. (6)

  ii) Explain the following:

    i) calgon conditioning   ii) caustic embrittlement. (6)

(OR)

24. b) i) How will you purify water by using ion-exchange resins? What are

  the advantages of this method? (6)

  ii) With a neat sketch, explain the reverse osmosis method of

  desalination. (6)

25. a) i) Draw and explain the phase diagram of Pb – Ag system forming
eutectic alloy. (6)

   ii) Explain the following terms involved in powder metallurgy.

      1) Compacting2) Sintering (6)

(OR)

25. b) i) State phase rule. Explain the various terms involved in the phase rule. (6)

   ii) How is characterization of nanomaterials carried? Explain the
principle involved in any one method. (6)

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