Register No: …………………………………

B.E/B.TECH DEGREE EXAMINATIONS: MAY/JUNE 2011

First Semester

CHY101: ENGINEERING CHEMISTRY

(Common to All Branches)

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

Answer All Questions: -

PART A (10 x 1 = 10 Marks)

1. Calomel electrode gets its name because it has:

  a) mercurous chloride   b) calcium chloride   c) platinum   d) potassium chloride

2. EMF of standard hydrogen electrode is

  a) 0.2344v   b) 0.3422v   c) 0v   d) 1.09v

3. The open circuit potential of a dry cell is:

  a) 1.2 V   b) 1.5V   c) 2.0 V   d) 2.5 V

4. The acid used in lead-acd battery is:

a) hydrochloric acid   b) nitric acid   c) phosphoric acid   d) sulphuric acid

5. All the naturally occurring processes proceed with:

a) increase in entropy   b) increase in enthalpy

c) increase of Helmholtz free energy   d) increase of Gibbs free energy

6. Identify the state function among the following(q=heat, w=work)

  a) q   b) q-w   c) q/w   d)qxw

7. Which one of the following gases is strongly adsorbed on solid adsorbents?

  a) oxygen   b) hydrogen   c) nitrogen   d) chlorine

8. For an adsorption process which one of the following statements is correct?

  a) ΔG=+ve   b) ΔA = +ve   c) ΔH = -ve   d) ΔS = +ve

9. Wavelength of UV radiation is in the range of:

  a) 1 cm – 10 cm   b) 400 – 800 nm   c) 150 – 40 nm   d) 100 – 1000 nm

10. Energy (E) of a reaction is related to frequency as:

  a) $E\gamma$=h   b) $E= h\gamma$ c) $E = h/\gamma$ d) $Eh = \gamma$

PART B (10 x 2 = 20 Marks)

11. State Kohlrausch law of independent migration of ions.

12. Define single electrode potential?

13. Name of anode, cathode and electrolyte of the dry cell.

14. What is meant by multiplication factor in a fission reaction? What should be its value in a nuclear reactor?

15. What are the two important limitations of I Law of thermodynamics?

16. What is the physical significance of entopy?

17. Define ion exchange adsorption.

18. Mention any two applications of adsorption chromatography.

19. What are disadvantages of Beer-Lamberts law?

20. What are the limitations of flame photometry?

PART C (5 x 14 = 70 Marks)

21. a) (i) Derive Nernst equation for single electrode potential. (7)

    (ii) How is pH of a solution is measured using glass electrode? (7)

    (OR)

    b) Explain the conductometric titration of

    (i) Strong acid Vs Strong base

    (ii) Weak acid Vs Strong base

    (iii) Mixture of acids Vs Strong base

    (iv) Precipitation titration

22. a) (i) Illustrate the construction and working of a lead acid battery. (7)

    (ii) Write a nuclear fusion reaction and discuss its characteristics. (7)

    (OR)

    b) With a neat diagram explain the components and working of Light Water nuclear power plant.

23. a) (i) Derive an expression for the entropy change for the isothermal expansion of an ideal gas. (7)

    (ii) Derive Gibbs Helmholtz equation. (7)

    (OR)

    b) Derive Van't Hoff isotherm and Van't Hoff iso chore equation

24. a) (i) Derive Langmuir adsorption isotherm. (7)

    (ii) Illustrate the role of adsorption in catalytic reactions. (7)

(OR)

b) (i) How is ion-exchange adsorption is applied in demineralization of water?　　(7)

　(ii) What are the factors that affect adsorption of solutes from a solution?　　(7)

25. a) (i) With Block diagram explain the working of IR spectrometer　　(7)

　(ii) Explain the method of estimation of iron by Colorimetry.　　(7)

(OR)

b) (i) With a block diagram explain the working of a flame photometer　　(7)

　(ii) Give the application of UV visible spectroscope.　　(7)

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