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B. E./B.Tech. (Full-Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2012  
COMMON TO ALL BRANCHES  
FIRST SEMESTER  
CY 171-Chemistry I

(REGULATIONS-2004)

Time: 3 hour

Max Mark: 100

Answer ALL questions

PART- A (10 x 2 = 20 Mark)

1. The free energy  $\Delta G$  for a process is  $-138\text{kJ}$  at  $30^\circ\text{C}$  and  $-135\text{kJ}$  at  $40^\circ\text{C}$ . Calculate the change in enthalpy  $\Delta H$  accompanying this process at  $35^\circ\text{C}$ .
2. Write three different statements of second law of thermodynamics.
3. Write notes on Freundlich adsorption isotherm.
4. Define auto-catalysis with one example
5. Explain radioactive decay of polonium.
6. Write isomerization reaction of cyclopropane to propane.
7. What are reversible and irreversible cells? Explain with each one example.
8. Define Polarization.
9. Write any two applications of colorimetry.
10. Define bathochromic and hypsochromic shifts.

PART- B (5 x 16 = 80 Mark)

11. i. Deduce Gibbs Helmholtz equation. (8)
- ii. Illustrate the entropy change of an isothermal expansion of an ideal gas. (8)
- 12a. i. Distinguish between physical adsorption and chemisorption. (8)
- ii. List out the various factors which influencing adsorption of gases on solids. (8)

(OR)

- 12b. i. Explain enzyme catalysis and deduce Michaelis-Menton equation. (8)
- ii. Discuss acid base catalysis with a suitable example and Write its kinetics. (8)
- 13a. i. Classify kinetics of second order reactions and discuss the characteristics of second order reactions with examples. (8)
- ii. Explain parallel reaction with suitable example and its kinetics. (8)

(OR)

- 13b. i. Describe the effect of temperature on reaction rate with an example. (8)
- ii. Derive the rate constant of a reaction using absolute reaction rate theory. (8)
- 14a. i. Derive Nernst equation and mention its applications. (8)
- ii. How will you measure the emf of the cell? Give details. (8)

(OR)

- 14b. i. Draw a neat diagram of glass electrode and explain the determination of pH using the glass electrode. (8)
- ii. Classify concentration cells and explain them. (8)
- 15a. i. How many types of transitions are possible in molecular spectra? Give details. (8)
- ii. Describe flame photometry and list out its applications and limitations. (8)

(OR)

- 15b. i. Discuss the theory and instrumentation of UV-Vis spectroscopy. (8)
- ii. Write any four applications of IR spectroscopy. (8)