Q-7. (a) Draw & explain Jablonski diagram.   (6)

(b) Define Quantum yield. Write factors affecting it. Write mechanism of dissociation of HI.   (8)

(c) What is photosensitization? Give two examples of photosensitization reaction.   (6)

Q-8. (a) How the definition of Lipids is different from the definition of amino acids and proteins? Write a detailed note on Lipids.   (8)

(b) Write down difference between reducing and nonreducing sugars.   (4)

(c) Explain primary, secondary & tertiary structure of proteins.   (8)

Lingaya's University, Faridabad
B.Tech. 1st Year (Term – III)
Examination – May, 2010
Applied Chemistry (CH-101)

Time: 3 Hours]   **[Max. Marks: 100**

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note: *All questions carry equal marks. Attempt five questions. Question 1 is compulsory. Select two questions from Section B & two from Section C.*

Section – A

Q-I Part A

Select the correct answer of the following multiple choice questions.

(i) The free energy change for a reversible reaction in equilibrium is

(a) zero (b) small positive   (c) small negative   (d) large positive

(ii) At peritectic point the number of phases present in Na-K system is

(a) 0   (b) 1   (c) 2   (d) 3

(iii) Hard water is not suitable for use in boiler because

(a) it has a higher boiling point   (b) it leads to scale formation

(c) it consumes more fuel in steam generation

(d) the quality of steam generated is not good.

(iv) The repeating unit in silicone is

(a) $RSiO$ (b) $R_2 SiO$ (c) $R_3 SiO_2$ (d) RSi_2O

(v) Chemically, the rust is mainly.

(a) Fe_2O_3 (b) $FeO.Fe_2O_3$ (c) $Fe_2O_3. xH_2O$ (d) $FeO.xH_2O$

(vi) Conradson apparatus is used to measure

(a) aniline point (b) oiliness   (c) carbon residue   (d) cloud point

(vii) The total hardness of water sample is 1.88^o Cl eq. Its hardness in ppm would be

(a) 26.88   (b) 0.188   (c) 18.8   (d) 34.65

(viii) The chemical formula of sodium zeolite is

(a) $Na_2O\ Al_2O_3\ x\ Si_2\ OyH_2O$ (b) $Na_2O\ Al_2O_3\ x\ SiO_2\ yH_2O$

(c) $Na_2O\ Al_3O_2\ x\ SiO_2\ yH_2O$ (d) $NaO_2\ Al_2O_3\ x\ SiO_2\ yH_2O$

(ix) For a reversible process

(a) $(\Delta S_{sys}+\Delta S_{sur})<0$ (b) $(\Delta S_{sys}+\Delta S_{sur})>0$

(c) $(\Delta S_{sys}+\Delta S_{sur})=0$ (d) $(\Delta S_{sys}+\Delta S_{sur})=\infty$

(x) At eutectic point of Pb-Ag system temperature is

(a) $327^{o}C$ (b) $203^{o}C$ (c) $303^{o}C$ (d) $961^{o}C$

(xi) Caustic embrittlement is a particular case of

(a) dry corrosion (b) stress corrosion
(c) wet corrosion (d) pitting corrosion

(xii) Which one of the following is not extensive property

(a) volume (b) viscosity (c) energy (d) mass

(xiii) The general formula for monosaccharides is

(a) $C_n\ (H_2o)_{n-1}$ (b) $C_n\ (H_2o)_n$ (c) $C_{n-1}\ (H_2o)_n$ (d) $C_{2n}\ (H_2o)_n$

(xiv) How many primary or normal amino acids are present in proteins

(a) 10 (b) 40 (c) 20 (d) 30

(xv) The lifetime of fluorescence is usually in the range of

(a) 10^{-3} to 10 s (b) 10^{-6} to 10^{-3} s (c) 10^{-9} to 10^{-6} s (d) 10^{-12} to 10^{-9} s

(xvi) ΔH for the reversible isothermal expansion of one mole of ideal gas at $27^{o}C$ from a volume of $1dm^3$ to $5dm^3$ is

(a) 1729J (b) -1729J (c) 0 (d) 365J

(xvii) Which one is the photo sensitizer

(a) 1,2 butadiene (b) 1,3 butadiene
(c) ethene (d) benzophenone

(xviii) Which one is not lubricant

(a) graphite (b) talc (c) coconut oil (d) diamond. (½x18=9)

(xix) Find the number of phases, component and degree of freedom in the following reaction.

$\qquad N_2\ (g) + O_2(g)\ =2NO(g)$ (1)

Part-B

(a) What is break-point chlorination and what are its advantages? (5)

(b) Calculate ΔG for a reaction at $537^{o}C$ from the data $\Delta H= -40KJ$, $\Delta G(337^{o}C) = -50$ kj assuming that ΔH remain constant during the temperature $337^{o}C$ to $537^{o}C$. (5)

Section – B

Q-2. (a) Derive the Calusius-Clapeyron Equation in its integrated form and give its significance. (12)

(b) Calculate the change in entropy for one mole of an ideal gas when its temperature rises from 400 to 800 K under (i) isochoric (ii) Isobaric condition ($C_v = 2.5$ R) (8)

Q-3. (a) How is the hardness of a water sample estimated by EDTA method? Describe the principle and general calculations involved. (10)

(b) Describe the Zeolite process used for the softening of water. What are the advantages and limitations of the process? (10)

Q-4. (a) What is the mechanism of Electro chemical corrosion? What factors affect it? (8)

(b) Write short note on the following: (6)

(i) Pitting corrosion (ii) Stress corrosion (iii) water line corrosion

(c) How nature of a metal affect corrosion (6)

Section- C

Q-5. (a) What type of lubrication is applied in sewing machine? Explain its mechanism. (6)

(b) What are the characteristics of synthetic lubricants? Mention two important synthetic lubricants along with their applications. (8)

(c) Explain the following properties of lubricants and discuss their importance (i) viscosity index (ii) flash & fire point (iii) iodine value. (6)

Q-6. (a) What is phase rule? Draw & explain phase diagram of one component system. (10)

(b) What is Pattinson's process? Explain. (4)

(c) Define component, degree of freedom and peritectic temperature with example. (6)