

Assiut University
Faculty of Science
Chemistry Department



January 2017
Time : 2 Hours

General Chemistry Final Exam for First Year Veterinary Students

(Section A: Non-Organic Chemistry)

Answer **Five Only** of the following questions: (25 Points)

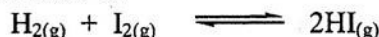
Q1: An aqueous solution is prepared by dissolving 1.5g of hemocyanin, a protein obtained from crabs, in 0.25L of water. The solution has an osmotic pressure of 0.00342 atm at 277K. What is the molar mass of hemocyanin? (5 Points)

Q2: State Le Chatelier's principle. Predict the effect of the following changes on the equilibrium of the reaction (5 Points)



- Decreasing the volume of the reaction
- Increasing the temperature of the reaction
- Adding more from SO_3 when the reaction is at equilibrium

Q3: 0.8 mole of hydrogen mixed with 0.8 mole of Iodine at a container with volume 250 ml, it was found at equilibrium formation of 0.7 mole Hydrogen iodide. Calculate the equilibrium constant (K_p) for this reaction at 30°C. (5 Points)



Q4: Calculate the pH of a buffer solution that contains 0.30 M acetylsalicylic acid and 0.15 M sodium acetylsalicylate. What is the pH after the addition of 0.02 M NaOH to the buffer solution? (5 Points)

Q5: Calculate the solubility of silver sulfate in 0.02 M Na_2SO_4 . (5 Points)

Q6: Calculate the pH values of the following solutions: (5 Points)

- 0.01 M NH_4OH
- 0.20 M CH_3COONa

K_a of acetylsalicylic acid = 3.0×10^{-4} , K_a of acetic acid = 1.8×10^{-5} , K_{sp} of silver sulfate = 1.4×10^{-5} , K_b of ammonium hydroxide = 1.8×10^{-5} , $R = 0.082 \text{ atm dm}^3 \text{ mol}^{-1} \text{ K}^{-1}$
Atomic weights: H= 1.00, C = 12.00, O = 16.00, I = 127 and Na = 23.00

See the next page

(Section B: Organic Chemistry)

Answer the following questions:

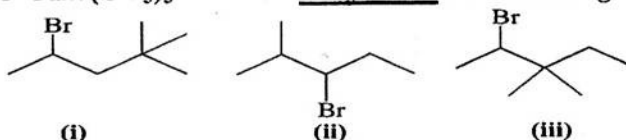
(25 Points)

Question 1:-

a) Answer using true (✓) or wrong (X) on the following:- (5 points)

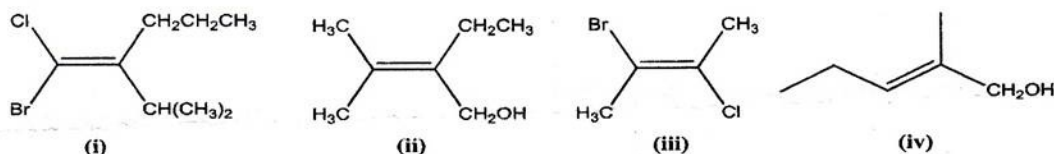
- The reaction of 2-bromopropane with sodium ethoxide in ethanol is called addition reaction.
- The hybridization of carbon in C-C sigma bond of ethene is SP^2-SP^2 .
- The bonds between the atoms in an organic molecule are generally ionic bonds.
- In a molecule of C_3H_8 , the total number of covalent sigma (σ) bonds is 8.
- The common name of $(CH_3)_3C-$ group is tert-butyl, while $(CH_3)_3CCH_2-$ is tert-penyl.

b) What the effect of $(CH_3)_3C-OK$ / $(CH_3)_3C-OK$ on only Two the following:- (2 points)



c) How to prepare alkanes by two different methods: (2 points)

d) Assign the following structures which of them are E and which are Z when it is possible:- (4 points)



Question 2:-

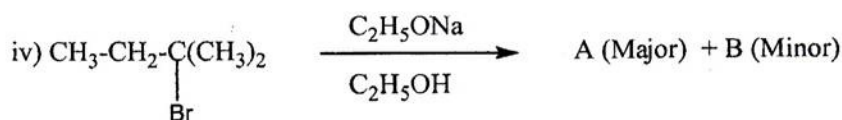
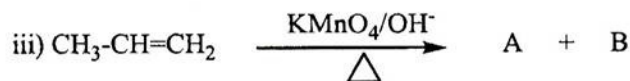
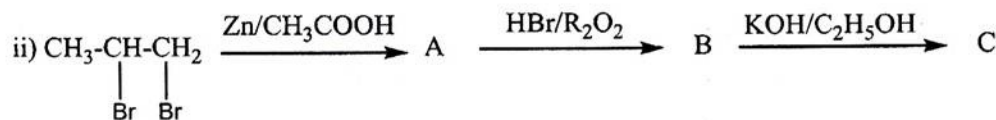
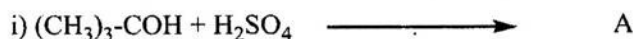
b) Discuss the mechanism of the following:- (4 points)

- Chlorination of methane.
- Anti-Markovnikov addition of HBr on propene.

a) Draw structure formulas for only Four of the following:- (4 points)

- 3-Ethyl-4-methylhexyne.
- 5-Chloro-4-methyl-2,4-heptadiene.
- (Z)-3-Bromo-2-butene.
- 1,5,5-Trimethyl cyclohexene.
- 4-Ethyl-2,3-dimethyl-2-heptene.

c) Complete the following equations and gave the name of the products:- (4 points)



Examiners:- Dr. Mostafa Farrag and Dr. Ahmed Fikry