Assiut University
Faculty of Science
Chemistry Department

Date: 2019
Time: 2 h

Final Examination of general chemistry (105 C) for 1st level students

Answer the following sections (A&B): **(50 Marks)**

Section (A)

Answer the following questions: **(25 Marks)**

1- Define the following terms giving **ONE** example: **(4Marks)**

a- Ionic bond. b- Covalent bond. c- Isomers. d- Resonance.

2- Explain the Markovnikov's rule and give an example. **(4 Marks)**

3- Expect the structure of alkyne when its Ozonolysis gave: **(3 Marks)**

(i) Two moles of formic acid.

(ii) One mole of acetic acid and one mole of propionic acid.

4. Write the structural formula for **FOUR** of the following compounds: **(8 Marks)**

(i) 2-Methyl cyclohexanol. (ii) 3-Methyl cyclopenetene. (iii) 1,4-Pentaadiene.

(iv) 2,3,5-Trimethyl-2-hexene. (v) 3-Methyl-1-butyne. (vi) Neopentane.

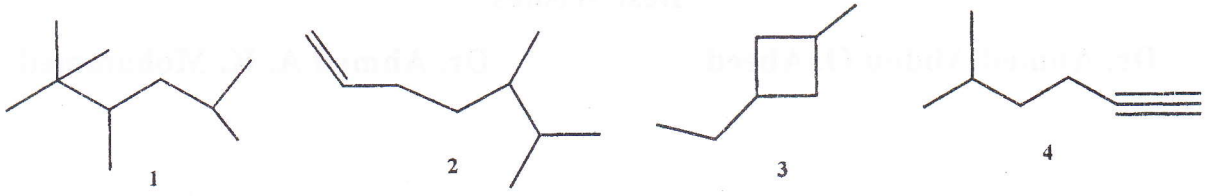
5. Complete the following equations: **(3 Marks)**

a- $H_3C-CH_3 \xrightarrow{H_2 / Ni}$

b- $HC\equiv C^- Na^+ \xrightarrow{CH_3I}$

c- $H_3C-CH_3 \xrightarrow[\text{flame}]{O_2}$

6. Write the IUPAC name of **THREE** of the following compounds: **(3 Marks)**



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Section (B)

Answer only five of the following: **(25 Marks)**

1. The following system is at equilibrium

$$S(s) + O_2(g) \rightleftharpoons SO_2(g) \qquad \Delta H = -297 \text{ kJ}$$

Explain the effect of the following on the direction of net reaction

a) Decreasing the temperature of the system
b) Adding O_2 gas
c) Increasing the volume of the system
d) Removing S

2. Some hydrogen and iodine are mixed at 229°C in a 1.00-liter container. When equilibrium is established, the following concentrations are present: [HI] = 0.490 M, [H_2] = 0.080 M, and [I_2] = 0.060 M. If an additional 0.300 mol of HI is then added, what concentrations will be present when the new equilibrium is established?

$$H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$$

3. a) What is the pH of 1 M CH_3COOH solution? ($K_a = 1.8 \times 10^{-5}$)
b) What will be the pH if 50 ml of 1 M NaOH was added to 50 ml of this solution?

4. You are provided with a solution of 1 M CH_3COOH and a solution of 1 M CH_3COONa. How can you prepare a buffer solution with a pH = 4.14 in 1 L. ($K_a = 1.8 \times 10^{-5}$)

5. Will a precipitate form if you dissolve 50 mg of $AgNO_3$ in a 100 ml tap water with [Cl^-] = 10^{-6} M? (Solubility of AgCl is 1.3×10^{-5} M)

6. What is the solubility (in g/100 ml) of $Mg(OH)_2$ in 0.1 M NaOH? ($K_{sp} = 1.8 \times 10^{-11}$)

A. Wts.: H = 1, N = 14, O = 16, Mg = 24, Ag = 108

Best Wishes

Dr. Ahmed Abdou O. Abeed **Dr. Ahmed A. K. Mohammed**