

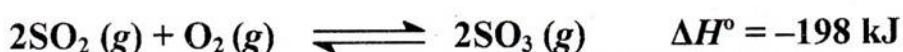
Section (B) Nonorganic Chemistry

Answer the Following Questions: (25 Marks)

First question: Answer Only Three from the following:

(12 Marks)

(a) The following system is at equilibrium. In which direction (right or left) will the position shift with the following changes:



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- (i) Lowering the temperature (ii) Decreasing the pressure
(iii) Adding more SO_3 (iv) Increasing the pressure of O_2

(b) What is the pH of a buffer that is 0.12 M in lactic acid and 0.10 M in sodium lactate? (K_a for lactic acid is 1.4×10^{-4})

(c) At 18°C , the solubility of CaC_2O_4 in water is 0.00067 gm/100 mL. Calculate its solubility product.

(d) Calculate the pH of NH_4NO_3 solution that is 0.071 mol/L.

$$(K_b \text{ NH}_4\text{OH} = 1.8 \times 10^{-5} \text{ and } K_w = 1 \times 10^{-14})$$

Second question: Answer Only Three from the following:

(13 Marks)

(a) At the start of a reaction, there are 0.249 mol N_2 , 3.21×10^{-2} mol H_2 and 6.42×10^{-4} mol NH_3 in a 3.5 L reaction vessel at 200°C . If the equilibrium constant (K_c) is 0.65 at this temperature for the reaction: $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$

Predict, which way the reaction will proceed?

(b) A solution contains 3.75 g of a nonvolatile hydrocarbon in 95 g of acetone. The boiling points of pure acetone and the solution are 55.9°C and 56.5°C respectively. What is the molar mass of the hydrocarbon? (For acetone the $K_b = 1.71^\circ\text{C}/\text{m}$)

(c) A solution of unknown substance in water at 27°C gives rise to an osmotic pressure of 3.85 atm. What is the molarity of the solution?

(d) Does a precipitate form when 0.1 L of 0.30M $\text{Ca}(\text{NO}_3)_2$ is mixed with 0.2 L of 0.06 M NaF? (K_{sp} for $\text{CaF}_2 = 3.2 \times 10^{-11}$)

(At. Wt.: H = 1 , C = 12 , N = 14 , O = 16 , Ca = 40.08, R = $0.082 \text{ atm.L.mol}^{-1}.\text{K}^{-1}$)

----- Good Luck -----

Examiners: Dr. Remon Melad Zaki & Dr. Hossieny Ibrahim

Final Chemistry Examination for First Year Veterinary Students

Section "A" Organic Chemistry

Answer the following questions:

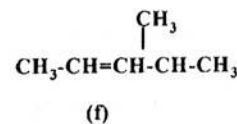
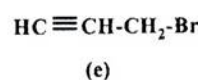
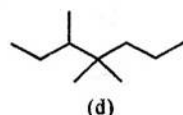
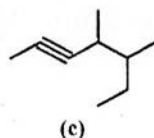
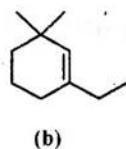
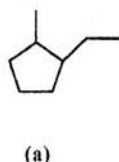
(25 Marks)

Question No. 1:

(15 Marks)

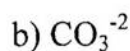
1) Give the IUPAC name for **ONLY FIVE** from the following:

(5 Marks)



2) Write the Lewis structure for **THREE ONLY** of the following ions:

(3 Marks)



3) What happens when? (Answer **FOUR ONLY**)

(4 Marks)

i) 2-Bromobutane was treated with ethanolic sodium ethoxide solution

ii) 2-Pentyne is reduced with H_2 , Pd/C (Lindlar's catalyst)

iii) Ethyne is hydrated in the presence of dil H_2SO_4 and HgSO_4

iv) Hydrogen bromide is added to propene in the presence of peroxide

v) 2-Methyl pentane is brominated in presence of UV light (hv) at 35°C .

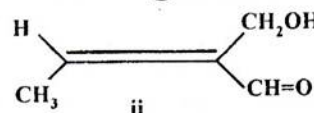
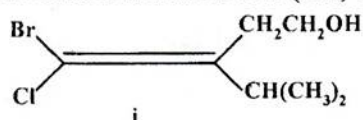
4) Which of the following structures could be classified as **Electrophiles** or **Nucleophiles**? (3 Marks)



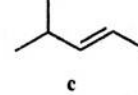
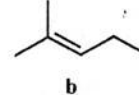
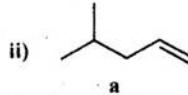
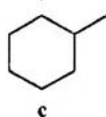
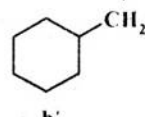
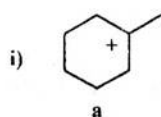
Question No. 2:

1) Write the Geometrical isomerism (cis, trans, E or Z) for the following alkenes:

(2 Marks)

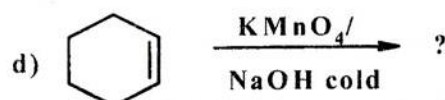
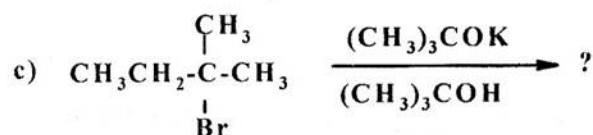
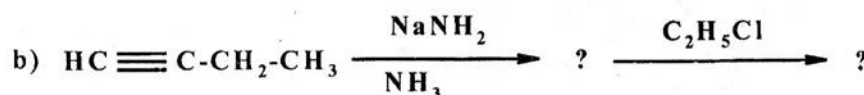


2) Which of the following **alkenes** or **carbocations** would be the **MOST stable** and **Why**? (2 Marks)



3) Complete **THREE ONLY** of the following equations:

(6 Marks)



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