

**Final Exam in Organic Chemistry for 1<sup>st</sup> Year (Biology) Students**

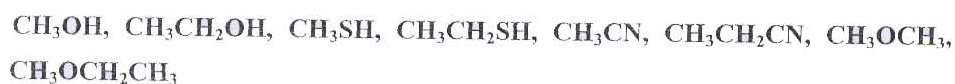
Answer the following questions:

**Question [1]**

(i) Outline all steps in a synthesis of propyne from each of the following:



(ii) With methyl, ethyl halides as your organic starting materials and using any needed solvents or inorganic reagents, outline synthesis of each of the following. More than one step may be necessary and you need not repeat steps carried out in earlier parts of this problem.



**Question [2]**

(i) Give structural formulas for the products formed when acetone reacts with each of the following reagents:

- $\text{CH}_3\text{CH}_2\text{MgBr}$ , then  $\text{H}_3\text{O}^+$ .
- $\text{HCN}$ , then  $\text{H}_3\text{O}^+$ .
- Hydroxyl amine.
- Semicarbazide.
- Phenyl hydrazine.
- $\text{HC}\equiv\text{CNa}$ , then  $\text{H}_3\text{O}^+$ .
- (1)  $\text{BrCH}_2\text{COOC}_2\text{H}_5$ ,  $\text{Zn}$ ; (2)  $\text{H}_3\text{O}^+$ .

(ii) Give a structural formulas and another acceptable name for each of the following compounds:

Formaldehyde – Ethyl isopropyl ketone – Dipropyl ketone – Acetaldehyde – Ethyl methyl ketone.



جامعة الفيوم  
Fayoum University

**Academic Year: 2011/2012**  
**1<sup>st</sup> Semester**  
**Organic Chemistry (1)**  
**Time: 2 h.**  
**January 12, 2012**

\*\*\*\*\*Answer the Following Questions\*\*\*\*\*

**Question No. 1:**

1. **GIVE** the structural formula and the IUPAC name of the following:
  - a) *neo*-Pentane.
  - b) *sec*-Butyl acetylene.
  - c) Methyl *iso*-propyl ketone.
  - d) Ethyl methyl ether.
2. Compound (A),  $C_5H_8$  reacts with  $Cu_2Cl_2$  to give a precipitate (B). Oxidation of (A) with excess  $KMnO_4$  yields an acid of the structure  $(CH_3)_2CHCOOH$ .
  - a) **WHAT** are the structures of (A) and (B)?
  - b) **REPRESENT** the reactions involved by chemical equations.
3. **ARRANGE** the following according to their acidity (give reason for your answer): Ethanol, *iso*-Propyl alcohol, and *tert.* Butyl alcohol.

**Question No. 2:**

- 1. COMPLETE** the following equations and name the products:
  - a) 2-Methyl-2-chloropentane + Alc. KOH.
  - b) 1-Butene +  $\text{KMnO}_4$ .
  - c) 2-Methyl-2-butene + HBr in the presence of  $\text{H}_2\text{O}_2$ .
  - d) Heating a mixture of calcium formate and calcium acetate.
- 2. GIVE** the structures of the Grignard reagent and aldehyde or ketone that would react to yield each of the following alcohols;
  - a) 2-Methyl-1-propanol.
  - b) 2,3-Dimethyl-3-pentanol.
- 3. The products** formed on treating ethanol with conc.  $\text{H}_2\text{SO}_4$  are depended on the reaction temperature and amount of ethanol used. **DISCUSS** indicating the reaction mechanism.