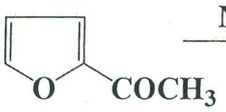
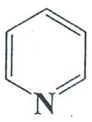
Mansoura University Faculty of Science Chemistry Department Subject: Chemistry Course(s): Org.Chem.337		1st Term 3rd Level Students Date: 25 / 12 / 2014 Time Allowed: **2** Hours Full Mark: **80** Marks

Answer All Questions

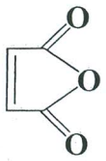
1- Predict the heterocyclic product(s): **[27 Marks]**

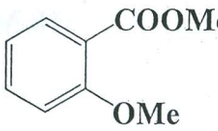
i) $CH_3CHO \xrightarrow[(CH_2OH)_2]{Br_2} \text{.....} \xrightarrow{NH_3} \text{.....} \xrightarrow{H_3O^+} \text{.....} \xrightarrow{NH_2\ CHO} \text{.....}$

ii)  $\xrightarrow{NH_3}$ ..... $\xrightarrow{H^+}$ .....

iii)  + PhLi $\xrightarrow{\triangle}$ .....

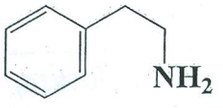
iv) $H_2C{=}\underset{H}{C}{-}CHO + NH_2NH_2 \longrightarrow$ .....

v)  +  $\longrightarrow$ .....

vi)  + $PhCOCH_3 \xrightarrow{CH_3O^-} \text{.....} \xrightarrow{HI} \text{.....} \xrightarrow{-H_2O} \text{.....}$

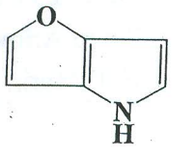
vii)  $\xrightarrow[POCl_3]{DMF\ /}$ ..... $\xrightarrow[reduction]{Wolf\text{-}Kischner}$ .....

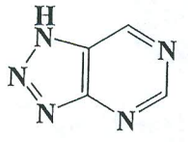
viii)  $\xrightarrow{Ph^-\ Na^+}$ ..... $\xrightarrow[ii)\ H^+]{i)\ CO_2}$ .....

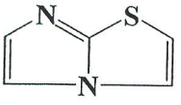
ix)  $\xrightarrow{CH_3CHO}$ ..... $\xrightarrow{H^+}$ ..... $\xrightarrow{Pd\text{-}C}$ .....

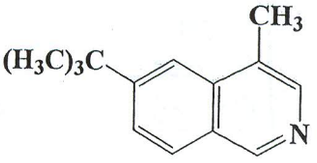
P. T. O.

2- a) Give acceptable name of each of these heterocycles: **[8 Marks]**

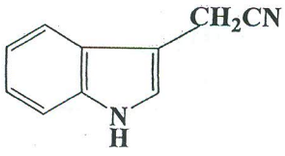
i) 

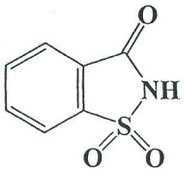
ii) 

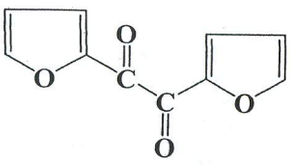
iii) 

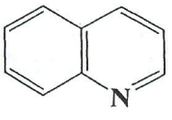
iv) 

b) Diagram one synthesis of each of the molecules below: **[18 Marks]**

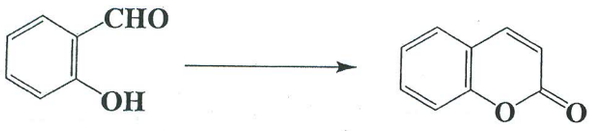
i) 

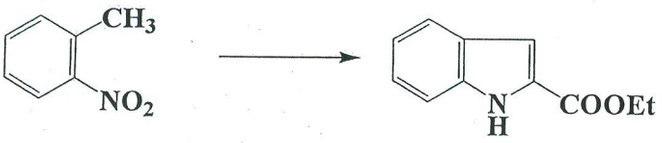
ii) 

iii) 

iv) 

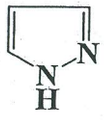
3- a) Diagram these conversions: **[9 Marks]**

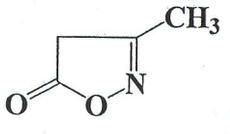
i) 

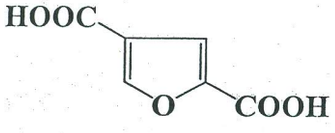
ii) 

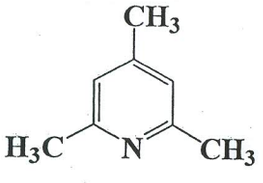
iii) 

b) Design the synthesis of these compounds: **[18 Marks]**

i) 

ii) 

iii) 

iv) 

Best Wishes and Good luck

Examiners: Prof. Dr. Ez Kandil, Prof. Dr. Evelin Boshra, A.Prof. Dr. Eman Keshk

Mansoura University
Faculty of Science
Chemistry Department
Subject: Biochemistry
Course: Hormones, Biochemistry 372

First Term Examination
3rd Level Students
Date Jan 22, 2015
Time Allowed: Two hours
Full Marks: 60 Marks

Answer the following questions:

I. Write in details on: (Illustrate your answer with graph) (15 Marks, 5 marks for each)

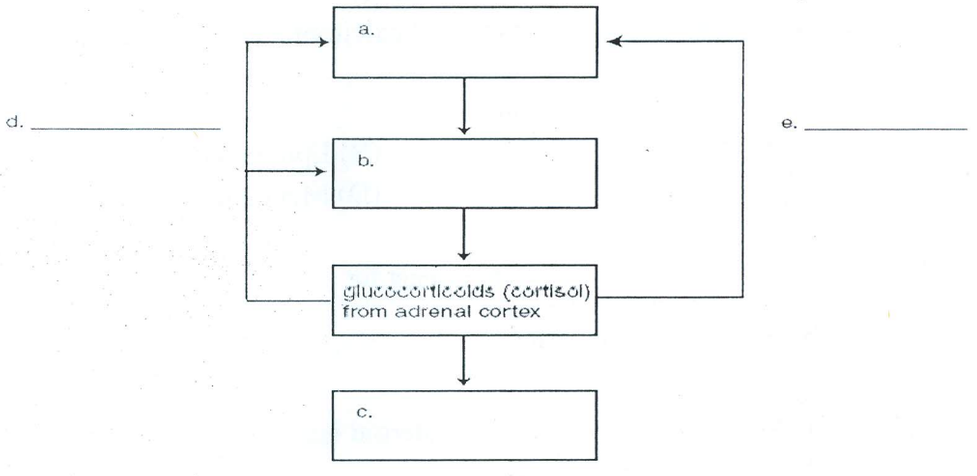
a. Cyclic AMP as second messenger.
b. The rennin-angiotensin-aldosterone pathway.
c. Hyperthyroidism due Graves'disease.

II. (25 Marks)

a. List the two hormones involved in calcium regulation and briefly describe the effect of each on blood calcium levels. **(10 Marks)**

b. Classify hormones according to distance at which hormone act. Give one example for each. **(5 Marks)**

c. Fill in the blanks in the following concept map indicating the mechanism by which glucocorticoid secretion is regulated. Use a (+) to indicate steps that are stimulatory and a (−) to indicate steps that are inhibitory. In the boxes, indicate the hormone released and the gland from which it comes. In the final box of the pathway, indicate the target cell responses. Also label the arrows indicating short loop and long loop negative feedback. **(10 Marks)**



III. Choose the correct answer :(20 Marks, 2 for each)

1. All the following statements about hormones are true except:
   (A) All of them require specific carriers in plasma
   (B) All of them require specific receptors in target cells

أنظر خلفه

٣ كيمياء - كيمياء كهربية (٣٤١)
كيمياء عامة

Mansoura University
Faculty of Science
Chemistry Department
Chem. 341
Subject: Electrochemistry

كلية العلوم
جامعة المنصورة

Third Year all programs

Time Allowed: 2 hrs
Full Mark: [60]
Jan. 2015

Answer the following questions:

First Question: **(15 marks)**

Discuss in detail the different types of reversible electrodes. Illustrate your answer with examples for each

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Second question: **(15 marks)**
Write on:
a) Concentration cells without transference **(7 marks)**
b) Nernst equation for electrode potential **(8 marks)**

Third question: **(15 marks)**
Discuss in detail:
a) Types of overpotentials **(7 marks)**
b) The kinetic for Irreversible electrode (polarized electrode) **(8 marks)**

Fourth question: **(15 marks)**
Write briefly on:
a) Decomposition potential and how it can be measured? **(5 marks)**
b) Standard cells, give example **(5 marks)**
c) Salt bridge and exchange current **(5 marks)**

Good Luck
Examiners: Prof.Dr. A.S.Fouda and Prof.Dr. A. Helmy

٣ كيمياء حيوى - أيض الماء والعناصر لفرقة ٢٠١٤

Mansoura university
Faculty of science
Chemistry Department
Subject : Biochem.3 74
Course : Water & Minerals Metabolism

First Term Exam 2014/2015
Third Level Biochem Students
Date : 12 Jan, 2015
Time Allowed : 2 hours
Total Mark : 60 Marks

Answer the following questions
Provide your answer with formula, equations, pathways, figures or tables wherever possible

Q1: A - Explain how excessive **iron** uptake can be toxic and clarify how iron absorbed, transported and storage between the different organs and tissues. **[10 Marks]**

B- **Put (√) for right sentence and put (X) for wrong sentence:** **[10 marks]**

1- Hypercapnia and respiratory acidosis occur when impairment in ventilation occurs and the removal of CO_2 by the lungs is less than the production of CO_2 in the tissues.

2- Low serum ferritin is the most sensitive lab test for iron deficiency anemia.

3- Hyperirritability means that increased neuromuscular exactability because **Mg** competitively inhibits the entry of Ca into neuron.

4- Mg deficiency should suspect to patients with hypokalaemia and hypocalcaemia.

5- Deep breathing decreases H+ ion concentration by elimination of acidic CO_2 while shallow breathing increases H+ ion concentration in the blood because of retention of acidic CO_2

6- Metabolic acidosis is serum HCO_3^-< 24 mEq/L.

7- Decreased anion gap is caused by hypoalbuminemia; hypercalcemia, hypermagnesemia, lithium intoxication and hypergamma-globulinemia.

8- Person with a low serum retinol concentration are more likely to be iron-deficient and anemic, compared to those with normal to high levels of retinol.

9- Elevated ferritin is used as a marker for iron overload disorders, such as hemochromatosis and porphyria and Transferrin is the most important physiological source of iron for red cells.

10- Vitamin D lowers the pH and increases of Ca-absorption from the intestine

Q2: Write briefly on the followings: **[20 Marks]**

1. Causes of rickets and osteomalacia.
2. Functions of calcium and magnesium

Q2: Write an account on the followings: **[20 Marks]**

1. Common causes of hypo- and hyperphosphatemia.
2. Functions of Sulfur and give examples of Iron-sulfur cluster.

GOOD LUCK **Prof.A.F.Abdel-Aziz**

٣ كيمياء حيوى
كيميائيات - كيمياء عضوية فيزيائية (٢٣٦ك)
كيمياء حيوية

Mansoura University Faculty of Science Chemistry Department Subject: Chemistry Course(s): Chem.336 Physical Organic Chemistry for 3rd Level Biochemistry, Chem. Zool., Chem. Bot., students		First Term Time Allowed: 2 Hours Date: Jan. 2015 Full Marks : 80

Answer All Questions

Q1: a) Which reaction of each pair of the following would you expect to be more rapid. **Explain** (12 Marks)

i- $CH_3CH_2Cl + CH_3O^-$ **&** $CH_3CH_2Cl + CH_3S^-$

ii- $(CH_3)_3C\text{-}Br$ **(1 M)** + EtO^- **(1 M)** **&** $(CH_3)_3C\text{-}Br$ **(1 M)** + EtO^- **(2 M)**

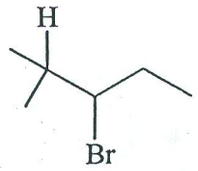
iii- $CH_3CH_2Br + CH_3COO^-$ **&** $CH_3CH_2Cl + CH_3COOH$

iv- $(CH_3)_3C\text{-}Br + H_2O$ **&** $H_2C{=}\underset{H}{C}{-}Br + H_2O$

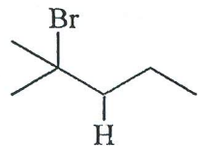
b- When toluene was treated with 1-chloro-2-methylproppane in the presence of anhydrous $AlCl_3$, the product was 1-*t*-butyl-4-methylbenzene. **Explain** the formation of such product. (4 Marks)

c) Which compound in the following pair undergoes E^2 reaction more rapidly when treated with CH_3ONa? **Explain your answer** (4 Marks)

i-

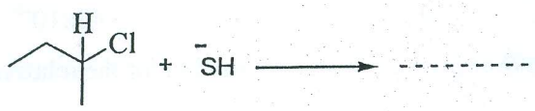


ii -



Q2: A) Complete the following equations showing only the **major organic product** and **discuss** which reaction mechanisms (SN^1, SN^2, E^1, and E^2) is the most likely. (18 Marks)

i-



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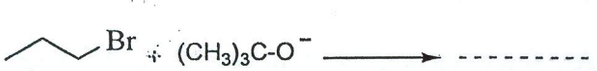
ii-



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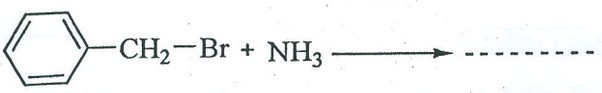

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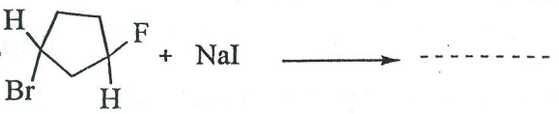

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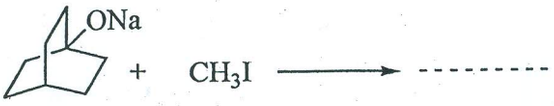
v-



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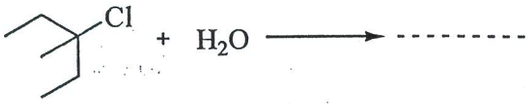
vi-



Please Turn to Next Page

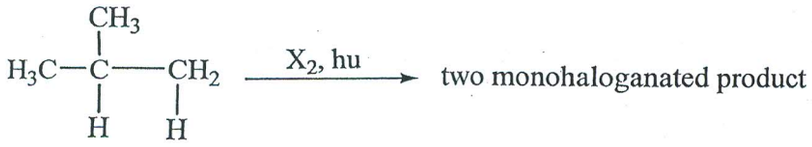
b) Sketch potential energy diagrams for the following reactions. Label the heat of reaction (ΔH) and activation energy (Eact.) in each case. (6 Marks)

i - $CH_4 + \dot{C}l \longrightarrow \dot{C}H_3 + HCl$ - 1 Kcal/mole ii - $2\,\dot{C}H_3 \longrightarrow CH_3CH_3$ + 88 Kcal/mole

C) Which of the following alkyl substrates will rapidly undergo E^1 reaction with strong base to give mixture of two isomeric alkenes? (6 Marks)

i- $(CH_3)_2C(Br)CH_2CH_3$ ii- $(CH_3)_2CHCH(Br)CH_3$ iii- $C_2H_5CH(CH_3)CH_2Br$ iv- $(CH_3)_2CHCH_2CH_2Br$

Q3: a-For the following reaction: (12 Marks)

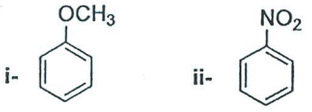


i- What are the monohalogenated product(s) indicating the yield percentage for each one when $X_2 = Cl_2$ & Br_2

ii- Explain why I_2 less reactive than Br_2 knowing that DH^o Kcal/mole values are shown in the following table:

Halogen	DH^o value	H-X	DH^o value	3° C-	DH^o value
I_2	36	HI	71	3° C-H	91
Br_2	46	HBr	87.5	3° C-X	X = I , 49.5 & X = Br, 63

b- Predict the major ring mononitrated product of the following aromatic compounds indicate your answer with resonsance structures in each case: (10 Marks)



c- The relative rates of ethanolysis of the following alkyl halides are as follows: (8 Marks)

CH_3CH_2Br	$CH_3CH_2CH_2Br$	$(CH_3)_2CHCH_2Br$	$(CH_3)_3C\text{-}CH_2Br$
1	0.28	0.03	42×10^{-6}

Are these reactions likely to be SN^1 or SN^2. **Explain** your answer providing an explanation for the relative reactivities that are observed

With our Best Wishes

Examiners: Dr. Ebrahim Abdel-Galil Dr. Soha M. Abdelmageed Dr. Ahmed El-Mekabaty

الكيمياء التحليلية - كيمياء الفلزات الانتقالية (أ ٢٠١٤)

كيمياء تحليلية
كيمياء عضوية
كيمياء فيزيائية

Mansoura University		**First Term**
Faculty of Science		**Third year**
Chemistry Department		**Date:** 29/12/2014
Subject: Inorganic & Analytical		**Time Allowed:** 2 hours
Course(s): Chemistry (323)		**Full Mark:** 80 Marks

Answer the following questions

[1] a) Write the electronic configuration for each of the following transition metal atoms and ions. Use [Ar] to represent the argon core configuration: $1s^2, 2s^2, 2p^6, 3s^2, 3p^6$. *(5 Marks)*

i- Co **ii- Mn^{3+}**

b) Identify the **ligands,** determine the **oxidation state** of the transition element in each of the following complexes, **coordination number**, **name** the following complexes and indicate the **possible isomers**. *(5 Marks)*

i- $Na_2[Ni(CN)_4]$ **ii-** $[Cl_3(NH_3)Fe\text{-}(OH)_2\text{-}Fe(NH_3)(en)Cl]$

c) Indicate what type of reaction in the following equations: *(5 Marks)*

i- $[Cu(acac)_2] + Py \rightarrow [Cu(acac)_2Py]$

ii- $CuSO_4.5H_2O \xrightarrow{96.5^\circ C} CuSO_4.4H_2O \xrightarrow{102^\circ C} CuSO_4.3H_2O \xrightarrow{115^\circ C} CuSO_4$

d) Which is more likely to form a high-spin complex— ***en*, F^-, or CN^-**? *(5 Marks)*

[2] a) What are the geometries of the following two complexes? *(5 Marks)*

i- $[AlCl_4]^-$ **ii-** $[Ag(NH_3)_2]^+$

b) Show the possible stereoisomers of octahedral $[Mn(H_2O)_2(en)_2]^{2-}$. *(5 Marks)*

c) Give the correct IUPAC name for each of the following coordination compounds: *(5 Marks)*

i- $Na_2[Ni(CN)_4]$ **ii-** $[Mn(en)_2I_2]ClO_4$

d) Complete the following: *(5 Marks)*

i- Three series of elements are formed by filling the *3d*, ... and ..... shells of electron.

ii- The covalent radii of the elements decrease from ..... to ..... across a row in the transition series

iii- The melting and boiling points of the transition elements are generally .....

iv- Many ionic and covalent compounds of transition elements are colored due to .....

v- Diamagnetism arises as a result of ..... electron spins in the atom.

[3] a) What is the formula of lithium Triiodotris(trifluorophosphine)nickelate(0)?
(Note: trifluorophosphine is a neutral ligand with the formula PF_3.) *(5 Marks)*

b) Which of the following can be a function as a **bidentate ligand**? *(5 Marks)*

$NH_3, C_2O_4^{2-}, CO, OH^-$

c) Complete the following equations: *(10 marks)*

i. $2VF_4 \xrightarrow[\text{disproportionate}]{\text{heat to } 600^\circ C}$ ..... + ...

ii. $Sc + NaOH \rightarrow$ ..... + ...

iii. $MnO_2 + KOH_{(s)} \rightarrow$ ..... $\rightarrow$ .....

iv. $3Mn_2O_3 + 8Al \rightarrow$ ..... + ...

v. $3Co(NO_3)_2 \rightarrow$ ..... + ... + ...

(Atomic numbers: ^{21}Sc, ^{22}Ti, ^{23}V, ^{24}Cr, ^{25}Mn, ^{26}Fe, ^{27}Co, ^{27}Ni, ^{29}Cu, ^{30}Zn)

Please turn over

[4] **Choose the correct answer to each of the following questions:** *(20 marks)*

1) Which one of the following can act as a tridentate ligand (occupies 3 coordination positions in a complex ion)?

a) $(CH_3)_2NH$ b) $CH_3HNCH_2CH_2NHCH_3$ c) NH_3 d) $CH_3HNCH_2CH_2NHCH_2CH_2NHCH_3$

2) The number of unpaired electrons in the low-spin complex, $[Co(CN)_6]^{3-}$ is

a) 0 b) 1 c) 2 d) 4

3) Which one of the following compounds is likely to be colorless?

a) $[Cu(OH_2)_6]^{2+}$ b) $[Zn(OH_2)_6]^{2+}$ c) $[Fe(OH_2)_6]^{2+}$ d) $[Cr(OH_2)_6]^{2+}$

4) d-Block elements among the following contain partially filled d – subshell and does not show variable oxidation states.

a) Zn b) Cd c) La d) Hg

5) d-Block elements have the maximum number of unpaired electrons.

a) Fe^{2+} b) Fe^{3+} c) Co^{3+} d) Co^{2+}

6) Ethylenediaminetetraacetate ion ($EDTA^{4-}$) is commonly referred to as a:

a) Hexadentate b) Monodentate c) Bidentate d) Tridentate

7) In the complex $[Fe(H_2O)_5(NO_2)]SO_4$, the oxidation state of iron is:

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

8) Which of the following will show maximum magnetic moment?

a) $3d^9$ b) $3d^5$ c) $3d^7$ d) $3d^8$

9) The most widely used commercial chemical as a paint pigment is:

a) SiO_2 b) MgO c) TiO_2 d) Al_2O

10) The aqueous solution of which salt is colored:

a) $Co(NO_3)_2$ b) Zn $(NO_3)_2$ c) $CrCl_3$ d) Both a and c

11) The lanthanide contraction is related to:

a) Density b) Ionic radii c) Color d) Valence electrons

12) Which among the following show variable oxidation states?

a) Mn b) Fe c) Co d) All of these.

13) Which among the following is a set of transition elements?

a) Cu, Au, Ni b) Sn, Bi, Na c) Sb, Pb, Al d) All of these.

14) The surrounding ions or molecules in complexes of transitional elements are called as

a) Chelates b) Ligand c) Matalloids d) None of these

15) Paramagnetism is exhibited by d-block elements due to the presence of

a) Unpaired electron b) Paired electron c) Incomplete f-orbitals d) None of these

16) Manganese is in +4 oxidation state in

a) MnO b) MnO_3 c) MnO_2 d) None of these

17) Which of the following scientists is associated with complex compounds?

a) Werner b) Pauling c) Lweis d) Wilkinson

18) In Lithium tetrahydro aluminate, the ligand is:

a) H b) H^+ c) H^- d) None of these.

19) IUPAC name for $[Co(NH_3)_5(ONO)]SO_4$ is:

a) Pentaaminenitrocobalt(II) sulphate
b) Pentaaminenitrocobalt(III) sulphate
c) Pentaaminenitritocobalt(II) sulphate
d) Pentaaminenitritocobalt(III) sulphate

20) With decrease in size of cation:

a) Complex forming tendency decreases.
b) Complex forming tendency increases.
c) Complex forming tendency does not change.
d) None of these.