المستوى الرابع - كيمياء ونبات - كيمياء تحليلية بيئية لـ ٤١٣

Mansoura University
Faculty of Science
Chemistry Department
Subject: Analytical Chemistry
Course Environmental Chemistry
Course code: CHEM 413.....

4thlevel(Chemistry,Botany and Biology students)
Date:**25-5-2013**
Time allowed: **2** hours
Full Mark:80 Marks

**Answer the Following Questions:**

1- Explain, with examples, the effect of toxic chemicals on enzymes. . (10marks)

2- Discuss the mechanism of action of insecticide ( 10 marks)

3- What is pollutant cycle? Illustrate such a cycle in the environment ( 10 marks)

4. Write short notes on **three** only of the following : (15 marks)

(a) Sanitary landfill method for waste disposal

(b) Incineration method of waste disposal

(c) Municipal waste composting

(d) The toxic effects of CO in the body. Is this effect reversible or irreversible? Does it act on enzyme system?

5- Define the following :

a) Heavy metals b) Chemical speciation c) BOD and DO

(15marks)

**Best wishes,**

Dr.I. Kenawy , Dr. M. Eldefrawy and Dr Weam Abo-Elmaty

Mansoura University
Faculty of Science
Botany Department
El-Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

**Final Examination in Botany**
**Second Term: June. 2013**

**Educational Year: fourth Level** **Program: Chemistry/ Botany**
**Subject: Bot (419)** **Course(s): Plant mineral nutrition and physiology of microorganisms.**
**Time: 2 hrs** **Date: 20 / 5 /2013** **Full mark:** 60 **Question mark: 20**

**Answer the following questions:**

| | |
|---|---|
| **Q1:** | **Write an account on each of the following:**<br><br>**(a) Transport of mineral nutrients across plasma membranes and show how can the carrier molecules transport ions passively and actively. (12 marks)**<br><br>**(b) Pathways for ion transport across the plant roots. (8 marks)** |
| Q2: | **a- Discuss briefly the occurrence, availability, functions and deficiency symptoms of N, K and Fe. (10 marks)**<br><br>**b- Illustrate structure and chemical composition of cell wall in filamentous fungi, with special reference to chitin biosynthesis. (10 marks)** |
| Q3: | **Discuss <u>each of the following:</u>**<br><br>**i- Bacterial metabolism of lactose. (6 marks)**<br>**ii- Apical growth mechanism of filamentous fungi (8 marks)**<br>**iii- Biodegradation of cellulose. (6 marks)**<br><br>**Examiners: Prof. M. A. Abbas Dr. Mervat hossny** |

المستوى الرابع - كيمياء نبات - تكنولوجيا حيوية ٢٠١٣

Mansoura University
Faculty of Science
Botany Department
El-Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

**Final Examination in Botany**
**Second Term: June. 2013**

**Educational Year: fourth Level** **Program (Branch): Botany/Chemistry**
**Subject: N(421)** **Course(s): Biotechnology**
**Time: 2 hrs** **Date: 1 / 06 /2013** **Full mark:** 60 **Question mark: 20**

## Answer the following questions:

**Q1** From your scientific point of view, what do you know about" Role of biotechnology in Medicinal Plants".

**Q2** Energy experts agree that the world is heading toward an unprecedented large and potentially devastating global energy crisis due to a decline in the availability of cheap oil and other fossil fuels. Fortunately, energy crops can provide possible alternatives. Discuss this statement via addressing the following:

(i) What is meant by energy crops?

(ii) What are the main steps of bioalcohol production?

(iii) What are the differences between sugarcane- and corn ethanol based industry?

(iv) What potential does Egypt has for bioethanol production?

(v) What kind of legislation would you ask the Egyptian public assembly to pass to secure the future energy needs of the Egyptian society?

**Q3** Different people have different perception for biotech crops. Some people see production of biotech crops as a dream that can solve the world's hanger and economic problems whereas others see it as a nightmare that will turn the world into hell. Discuss this statement through addressing the following:

(i) What is meant by a biotech crop?

(ii) Typical experimental steps for production of a new biotech crop,

(iii) Enumerate the general goals of biotech crop production,

(iv) Examples of risk and benefits of biotech crops and how to assess them.

(v) Regulatory polarization of biotech crops production worldwide.

**Best wishes**

**Examiners:** Prof. Mohamed Naguib Dr. Farag Ibraheem

المستوى الرابع - كيمياء نبات - الكيمياء اللاعضوية وكيمياء العناصر الثقالية (ك) لعلوم
كيمياء حيوان

| | | |
|---|---|---|
| Mansoura University<br>Faculty of Science<br>Chemistry Department<br>Subject: Chemistry (Chem. 425)<br>Course(s): Inorganic Chemistry | | Second Term<br>4th level chemistry/zoology & botany<br>Date: 4/6/2013<br>Time allowed: 2 hours<br>Full Mark: 80 Marks |

**Question:1**

**I. Write short notes on the following:** **(16 marks)**

a. Magnetic properties of lanthanides.

b. Separation methods of lanthanides.

c. Actinides ores.

d. Nuclear criticality.

**II. Complete the following equations:** **(10 marks)**

a. $^{252}_{98}Cf + {}^{11}_{5}B \rightarrow \cdots\cdots + 5\ {}^{1}_{0}n$

b. $^{242}_{96}Cm + {}^{4}_{2}He \rightarrow \cdots\cdots + {}^{1}_{0}n$

c. $\cdots\cdots + {}^{4}_{2}He \rightarrow {}^{242}_{96}Cm + {}^{1}_{0}n$

d. $^{238}_{92}U + {}^{16}_{8}O \rightarrow \cdots\cdots + 4\,{}^{1}_{0}n$

e. $^{254}_{99}Es + \beta \rightarrow \cdots\cdots$

**Question:2**

**I. Complete the following statement:** **(14 marks)**

a. Cerium is act as a strong .....agent, while Europium is act as a strong ..... agent.

b. According to ....., the element with ..... atomic number is more abundant than that with ..... atomic number.

c. The regular decrease in the size of lanthanide ions is known as ....., this is due to greater effect of ..... than that of the .....

d. The transitions of the f-electrons are responsible for ..... properties of the lanthanide ions, such as ....., ..... and .....

e. The actinide series contain the ..... elements with atomic numbers ..... through ....., from ..... through .....

f. Neodymium used in the manufacture of ..... for laser applications while, praseodymium used to create .....

g. Uraniumtrioxide is ..... magnetic with ..... colour while, uraniumdioxide is ..... with ..... colour.

من فضلك انظر في الخلف ◄

**Question:3**

I. On the basis of VBT predict the geometry & magnetic moment of these complexes: $[Fe(CN)_6]^{3-}$ & $[FeF_6]^{3-}$, then discuss the limitation of VBT. (10 marks)

II. Which complex of the following pairs has the larger value of $\Delta_o$: (10 marks)

a. $[Fe(H_2O)_6]^{3+}$ & $[Fe(H_2O)_6]^{2+}$

b. $[Cr(H_2O)_6]^{2+}$ & $[Mn(H_2O)_6]^{3+}$

c. $[Co(H_2O)_6]^{2+}$ & $[Ni(H_2O)_6]^{2+}$

d. $[Pd(H_2O)_6]^{2+}$ & $[Pt(H_2O)_6]^{2+}$

e. $[Ni(CN)_6]^{3-}$ & $[CoCl_6]^{3-}$

**Question:4**

I. For the $Co^{3+}$ ion, the electron pairing energy (P) is about 16,800 $cm^{-1}$ & the crystal field splitting energy values ($\Delta_o$) for the $[CoF_6]^{3-}$ & $[Co(NH_3)_6]^{3+}$ complexes are 13,000 $cm^{-1}$ and 23,000 $cm^{-1}$, respectively.

a. Which of these complexes have high spin configuration?

b. Calculate the number of unpaired electron & the magnetic moment ($\mu_s$) for each complex?

c. Calculate the CFSE for both complexes? (10 marks)

II. $[Sc(H_2O)_6]^{3+}$ complex is diamagnetic while, $[Ti(H_2O)_6]^{3+}$ complex is paramagnetic, explain this experimental observation using MOT. (10 marks)

At. No. [Sc = 21, Ti = 22, Cr = 24, Mn = 25, Fe = 26, Co = 27, Ni = 28, Pd = 46, Pt = 78]

Good Luck

Dr. Rania R. Zaky

المستوى الرابع - كيمياء - الأبوهيدرات ٤٣٤ ك
كيمياء نبات
كيمياء حيوان

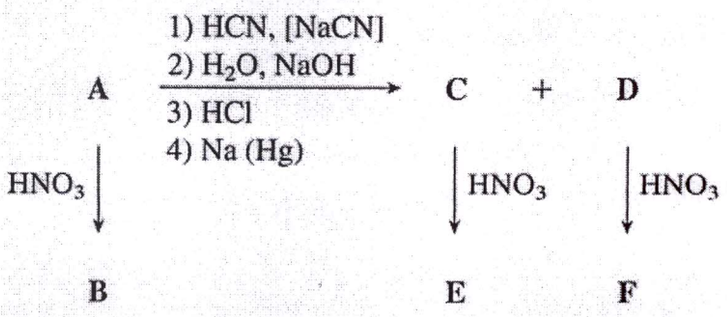
Mansoura University
Faculty of Science
Chemistry Department
El- Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم الكيمياء
منصورة – مصر

**Second Semester: Final Exam. 2013**

**Educational Year: Fourth Year**
**Course (s): Carbohydrates Chemistry** — **Subject: Chemistry**
**Date: 8 June/ 2013** — **Full Mark: 80**
**Course Code: Chemistry 434** — **Time: 2 Hours**

**1- a- Monosaccharide A in the following scheme is a D-aldopentose. Compound E does rotate plane-polarized light, wherease compound B and F do not. Show the structures of A, B, C, D, and E. [10 Marks]**




**b- Discuss the effect of Both Tosyl chloride and Periodic acid on Monosaccharide A. [10 Marks]**

**2-a- Explain by equation conversion of D-arabinose to higher aldose & ketose. [5Marks]**

**b- Starch is a polysaccharide contains amylose and amylopectin used for energy storage in plant.**

**i-Describe the type of glycosidic bond in it. [5Marks]**

**ii-What the effect of both $HNO_3$ and trityl chloride on aldose-monosaccharide units obtained by hydrolysis of starch. [5Marks]**

**c- Sucrose and Lactose are disaccharides; which of them does not undergoes Mutarotation? [5Marks]**

**3- The Following disaccharides consisting of two monosaccharide units:**

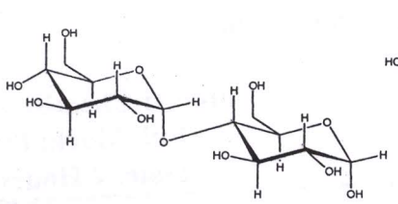
**i- Draw the Fisher projection and Haworth formulation of the hydrolyzed monosaccarides of compound 2. [5Marks]**

**ii- Which of these disaccharides has reducing power (explain by equations in compound 3). [5 Marks]**

**P.T.O**

**iii - Elucidate the Point of attachment in compound 1. [5Marks]**

**iv- Describe the type and point of attachment of each glycosidic bond in all disaccharides. [5Marks]**



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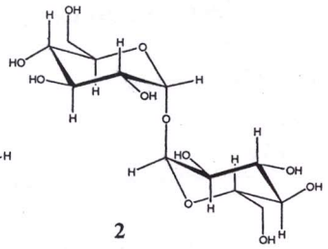

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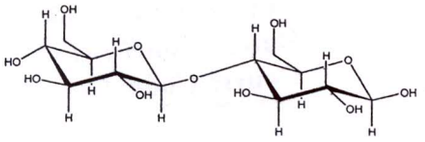

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**4- a- Explain by equation, how you can proof of glucose stereochemistry. [5Marks]**

**b- Determine the structure of lactose. [5Marks]**

**c- Convert of the following: [5Marks]**

**i- D-Ribose to D- arabinose**

**ii- Glucose to Fructose**

**d- Formation of osatriazole from D-Fructose. [5Marks]**

**Best regards,**

**Prof. Dr. Wafaa S. Hamama & Dr. Mona El-Sayed**

Mansoura University
Faculty of Science
Chemistry Department
Chem446

May 2013
4th Level,Chem. Botany
Time Allowed: 2 hrs
Full Mark: 80Marks

المستوى الرابع كيمياء نبات، كيمياء حيوان
الكيمياء الحيوية

**Answer the following questions:**

## Section 1(catalysts&catalysis)

1- Discuss the following:- *(10 marks)*

a- Catalyst activity and selectivity

b- Deactivation of catalyst

c- Autocatalysis

d- Specific acid catalysis

2- Derive the equation rate of enzyme catalysis. *(10 marks)*

3- Vm for an enzymatic reaction is 5 µmol per minute when 2 µg of an enzyme whose molecular weight is 27.000 is present.

What is the turnover number? *(5 marks)*

4- What is the rate equation of the following, *(5 marks)*

$$A+B+C \leftrightarrow ABC$$

$$ABC \rightarrow P+C$$

5- Discuss the effect of the catalyst on a reversible reaction *(5 marks)*

6- Define the nucleophilic and electrophilic catalysis. *(5 marks)*

## Section II (colloids)

I) **(a) Complete the following:** (4 marks)

A silver iodide sol AgI is stabilized by a small excess of KI, the particles are ..... Charged. The attached ..... ions constitute the inner portion of the double layer are called ..... ions and the ..... ions the outer layer are called.

(b) **Discuss three only of the following:** (18 marks)

(i) The procedure adobted for the determination of gold number.

(ii) Electrodialysis.

(iii) Emulsifier.

(iv) Two methods for preparation of sol.

(v) Sedimentation by gravity.

(فضلا اقلب الصفحة)

**II. (a) Tick (√) on the correct answer:** (4marks)

The viscosity of hydrophobic sol is:

- Equal the viscosity of the dispersion medium. ( )
- Greater than that of the dispersion medium. ( )
- Less than that of the dispersion medium. ( )

**(b) Give reason on two only of the following:** (10marks)

i) Agglomeration of sols.

ii) Tyndall effect of a colloidal solution.

iii) Many colloidal systems are colored.

**(c) Define:** (4marks)

i) The dispersity of the system

ii) Salting out

iii) Negative adsorption

Mansoura University
Faculty of Science
Chemistry Department
Subject: Electrochemistry

Date :June 2013
Code : Chem. 341
Full Mark : 60
Time Allowed : 2hours

**Answer All Questions**

**First Question : ( 20 Mark )**

[A] Write with examples on : ( 12 Mark )

(i) Metal- Metal ion electrode. (ii) Amalgam electrode.

(iii) Gas electrode. (iv) Metal-insoluble salt electrode.

[B] For the cell : Pt / HCl / Ag/AgCl ( 8 Mark )

(i) What is the type of the cell and why? (ii) Determine the emf of the cell.

(iii)Use this cell for determination the standard electrode potential of Ag/AgCl electrode

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**Second Question : ( 20 Mark )**

Discuss in detail :

[A] Decomposition potential. ( 10 Mark )

[B] Electrode kinetics for reversible electrode . ( 7 Mark )

[C] Sulphation . ( 3 Mark )

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**Third Question : ( 20 Mark )**

[A] Give reason : ( 8 Mark )

(i) Dry cell is irreversible cell . (ii) $E^{o}$ for concentration cell is zero.

(iii) The maximum emf obtainable from a simple cell is 2 V.

(iv) Use of glass electrode is the most convenient method for measuring solution pH.

[B] What is the difference between chemical cell and concentration cell. ( 3 Mark )

[C] Write on electrode concentration cell without transference. ( 5 Mark )

[D] Complete : ( 4 Mark )

(i) In Cd-Weston cell .....is the –ve electrode and.....is the +ve electrode.

(ii) When the electrode is polarized, the overpotential plays two roles : .....

and .....

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Good Luck

Prof.Dr. Ahlam M.A.Helmy

المستوى الرابع - كيمياء نبات - جغرافيا نباتية - فلورا مصرية - مجتمع نباتي (٤٢٠ بوت)

Mansoura University
Faculty of Science
Botany Department

**Final Examination in Botany**
**Second term: June 2013**

**Educational Year: Fourth Level** **Program: Chemistry &Botany**
**Subject: Bot. (420)** **Course(s): Plant Geography – Flora &Plant Community**
**Time: 2 hrs** **Date: / /2013** **Full mark: 60** **Question mark: 20**

**Answer the following questions:**

**Q.1** **Write in detail on Two Only of the following:** (20 marks)
A- The Deltaic Mediterranean coast of Egypt.
B- The habitat types and characteristic vegetation in the Egyptian Deserts.
C- Sinai region.

**Q.2** A- Compare and construct between Wadi El-Natrun Depression and Siwa Oasis with particular reference to location, climate, habitats and vegetation types. (10 marks)

**B- Discuss each of the following:**
1. Life forms of plants. (6 marks)
2. Types of quadrates. (4 marks)

**Q.3** **Give an account on:**
A- Animal dispersal. (7 marks)
B- Barriers. (7 marks)
C- Types of terrestrial habitats. (6 marks)

**Examiners:** Prof. Ibrahim Mashaly Prof. Sayed El-Halawany

Mansoura University
Faculty of Science
Chemistry Department
Subject: Polymer & Environmental Chemist

First Term
4th Year: General Student
Date: May 2013
Time allowed: 2 h
Total Marks: 60 marks

**Answer the following questions:**

**1- Compare** between each of the following: (15 marks)

*a - Thermoplastic and Thermoset polymers.*
*b- Alternating, Graft and Block copolymers.*
*c- Isotactic, Syndiotactic and Atactic polymers.*
*d- Chain-growth and Step-growth polymerization.*
*e- Linear, Branched, Network, Star and Dendrimers polymers.*

2- Write short notes on the different types of initiators generally used in free radical Polymerization. Then select one of them suitable for illustrating the mechanism of polymerization of *styrene* monomer. (15 marks)

3- a) In polymerization of phthalic and ethylene glycol, although we get 80% degree of conversion we didn't obtain a polymeric material. Explain. (8 marks).

b) Derive a mathematical expression for the kinetics of free radical polymerization (7 marks).

4- a) Compare between cellulose, chitin and chitosan (7 marks).

b) By chemical equations, illustrate how to prepare polyvinyl alcohol and polyvinyl amine. (8 marks).

**With our best Wishes**

***Examiners:***

**Dr. Dalia Mokhtar Ayad and Dr. M. Monier**