المستوى الرابع - كيمياء نبات - الخضر والفروبات (٤٤٦)

Mansoura University
Faculty of Science
Chemistry Department
Chem446 (Catalysis&Colloids)

May 2012
4th Level,Chem. Botany
Time Allowed: 2 hrs
Full Mark: 80Marks

Answer the following questions:

Q1- Choose the correct answer *(10 Marks)*

i. ***Predict the kinetics of a catalyzed reaction which has a $\Delta Go = -60$ kJ/mol?***

a- It will exhibit very rapid kinetics.

b- It will exhibit very slow kinetics.

c- The kinetics of the reaction cannot be predicted.

d- The kinetics depends on the nature of the reactants and/or products.

ii. ***Linear free energy relationship***

a- Relates structure and activity.

b- Predicting rates or equilibria

c- Elucidate reaction mechanism

d- All previous answers are correct

iii. ***Nucleophilic catalysis is catalysis by***

a- General base b- Electrophile c- Proton

iv. ***Lewis base***

a- accept proton

b- gives hydroxyl ion

c- is an oxidizing agent

d- All previous answers are wrong

v. ***In autocatalysis, the reaction is catalyzed by***

a- One of its reactants

b- One of its reactants and/or products

c- One of its products

d- Adding an external catalyst

vi. ***The effect of catalyst on a reversible reaction***

a- Increases the equilibrium constant value

b- Shifts the equilibrium to the right direction

c- Increases the free energy

d- Keeps the same heat content

vii. ***In a colloidal solution_____***

a) the size of a colloidal particle lies roughly between 0.1 nm to 1 nm.

b) the particles have a tendency to settle when the solution is left standing.

c) the particles pass through ultrafilter papers and animal and vegetable membranes.

d) the dispersed phase is uniformly distributed in the dispersion medium

viii. ***Tyndall Effect in colloids is due to _____.***

a) dispersion of light b) merging of light rays c) scattering of light

ix. ***What factor distinguishes a suspension from a colloid?***

a) light reflects off the particles of a suspension

b) the particles of a suspension will sink out if left over time to rest

c) suspensions are clear

d) suspensions cannot be filtered

x. ***An example of an emulsifying agent would be__***

a) oil b) soap c) water d) salt

Q2- Discuss the kinetics of a homogeneous bimolecular reaction (one mechanism). ***(10Marks)***

Q3- V_m 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? ***(10Marks)***

Q4- Discuss the Michaelis-Menten equation for enzymes, $v = \frac{v_{max}[S]}{K_m + [S]}$ ***(5Marks)***

Q5- Discuss only two processes contribute to the loss of catalytic activity (*Catalyst Deactivation*). ***(5Marks)***

Q6- What are the advantages and disadvantages of homogeneous catalysts and heterogeneous catalysts? ***(5Marks)***

Q7- Write the Factors that determine choice of catalysts ***(5Marks)***

Q8- Interpret the role of catalyst modifiers ***(5Marks)***

Q9- Predict the effect of pH on K_{obs} for the specific acid and specific base catalysis ***(5Marks)***

Q10- What is the origin of a charge on the colloidal particles? ***(5marks)***

Q11- Draw the Change in concentrations over time for E, S, ES and P in Michaelis-Menten mechanism. ***(5Marks)***

Q12-What do you understand from the variation of α and β, in Bronsted catalysis equation, from 0⟶1. ***(5Marks)***

Q13- Why $MgCl_2$ is a better coagulate than KCl for As_2S_3 ***(5Marks)***

المستوى الرابع كيمياء ونبات - البيوت البيئة كـ ٤٣٨

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Organic Chemistry** **Course: Polymer & Environmental Chemistry (Chem 438)**		**Second Term** **Fourth Level – Bio-Chem, Zoology-Chem, & Botany-Chem** **Date: June 30, 2012** **Time allowed: 2 hours** **Full Mark: 60 Marks**

Answer the following questions:

[1] (a) **Define** the polydispersity index of a polymer and **draw** a typical molecular weight distribution curve of a homo- and polydispersed polymers. **[3 Marks]**

(b) **Explain by equations the following statement:**
"The rate of a free radical vinyl polymerization reaction is directly proportional to the square root of initiator concentration". **[8 Marks]**

(c) **Write briefly on** the classification of polymers according to their thermal properties, origin and chain branching. Give examples. **[4 Marks]**

(d) **Mention the main differences** between free radical and condensation polymerization. **[5 marks]**

[2] (a) **Discuss** the molecular weight determination of a polymer by Osmometry, Cryoscopy and Ebulliometry. **[8 Marks]**

(b) **Describe by equations** the general mechanism of the free radical polymerization reactions of styrene in presence of AIBN as initiator and CCl_4 as solvent. **[8 Marks]**

(c) **Show with drawings** the differences between bulk and solution polymerizations. **[4 Marks]**

[3] (a) **Discuss with drawing** the stratification (regions) of the atmosphere. **[7 Marks]**

(b) **Explain by equations** the mechanism of Ozone depletion by Chlorofluorocarbons (CFCs). **[7 Marks]**

(c) There are different types of photochemical reactions occur in the atmosphere. **Write briefly** about **four** of them. **[4 Marks]**

(d) **Mention five** of the most common green house gases responsible for global warming. **[2 Marks]**

With Best Wishes

Examiners:

Dr. Ibrahim M. El-Sherbiny Dr. Mohamed Moneir

كيمياء دورية - كربوهيدرات

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

جامعة المنصورة
كلية العلوم
قسم الكيمياء
المنصورة – مصر

Second Semester: Final Exam. 2012

Educational Year: Fourth Year

Course (s): Carbohydrates Chemistry **Subject: Chemistry**

Date: 19 /June/ 2012 **Full Mark: 80**

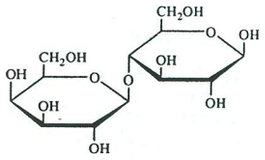
Course Code: Chemistry 434 **Time: 2 Hour**

1- a – The Following disaccharides 1, 2 and 3 consisting of two monosaccharide units:

i- Name the monosaccharide unit & describe each glycosidic bond. [4Marks]

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

iii- Elucidate the Point of attachment in compound 1.[3Marks]



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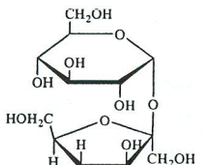

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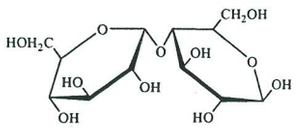

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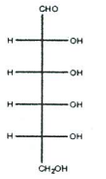

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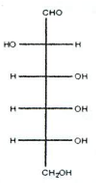


5

b- i- Convert epimer 4 to another epimer 5. [4Marks]

ii- Formation of osatriazole from D-Mannose. .[3Marks]

iii- Explain by equation conversion of D-ribose to higher aldose & ketose. [3Marks]

2- Raffinose is a trisaccharide is found in legumes and vegetables.

a- Describe the glycosidic bond in it. [3Marks]

b- What the effect of both acetone and tosyl chloride on aldoso-monosaccharide units obtained by hydrolysis of raffinose. [4Marks]

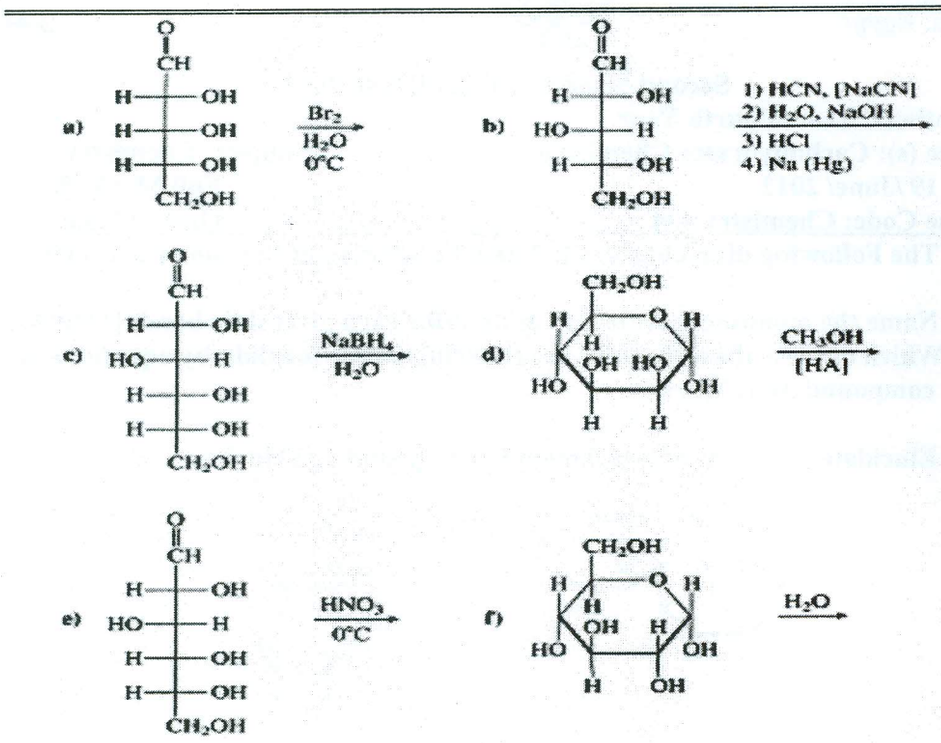
c- How can you elucidate the ring structure of monosaccharide? [4Marks]

d- Sucrose and maltose are disaccharides; which of them does not undergoes Mutarotation? [4Marks]

e- Compound (A) in L-form $C_5H_{10}O_5$ reacted with $PhNHNH_2$ gave an osazone, then treated with HCl gave ozone followed by reaction with HCN then hydrolysis and lactonization and finally enolization gave acid (B). Strong oxidation of (B) gave oxalic acid + L-threonic acid . What the structure of (A). [5Marks]

P.T.O

3) **Complete the 5 part of the following equations.[20Marks]**



4) a) **Write Fischer projections of: [20Marks]**

i- 3-deoxyD-ribose ii- L-Fucose (6-deoxy-L-galactose).

b) **Which of the following would be expected as reducing sugars? Why?**

i- D-Fructose ii- L-Arabinose iii-sucrose iv –Amylose

v- Maltose vi-cellobiose vii- D-Galactitol

c) **α-D-glucose + 112.0 → + 52.50 ← + 19.0 β- D-glucose**

for glucose above represents

(i) Optical isomerism

(ii) Mutarotation

(iii) Epimerisation

(iv) D and L isomerism

d) **The carbohydrate of the blood group substances is**

(i) Sucrose (ii) Arabinose

(iii) Maltose (iv) Fucose.

e) **Explain by equation, how you can determine the size of ring structure of glucose**

مع أطيب تمنياتنا بالتوفيق

Examiners:

Prof. W.S.Hamama, Dr. S.Shaaban

المستوى الرابع كيمياء/نبات ، كيمياء/حيوان . الكيمياء الناشئة العناصر الانتقالية

Mansoura University Faculty of Science Chemistry Department Subject: Chemistry (Chem. 425) Course(s): Inorganic Chemistry		Second Term 4^{th} level chemistry/zoology & botany Date: 23/6/2012 Time allowed: 2 hours Full Mark: 80 Marks

"Answer the following questions"

• Question (1):

I- Write short notes on the following: **(15 marks)**

a. Ion exchange method for separation of lanthanides.
b. Complex formation of lanthanides.
c. Extraction of thorium.

• Question (2):

I- Complete the following equation: **(10 marks)**

a. $Ce + O_2 \xrightarrow{heat}$ ....
b. $Eu_2(SO_4)_3 \xrightarrow{electrolysis}$ ....
c. ${}^{235}_{94}Pu + {}^{4}_{2}He \xrightarrow{-2\,{}^{1}_{0}n}$ ....
d. ${}^{238}_{92}U + {}^{16}_{8}O \xrightarrow{-4\,{}^{1}_{0}n}$ ....
e. $UO_2 \xrightarrow{HF}$ .... $\xrightarrow{Al/900\ ^{o}C}$ ....

II- Complete the following statement: **(15 marks)**

a. All lanthanide elements are present in nature except .... which consider to be .... element.
b. Cerium is act as a strong .... agent, while Europium is act as a strong .... agent.
c. All actinides are .... elements, so they dominate the study of .... chemistry.
d. ThO_2 containing 1% cerium give .... by heating in gas flame which used in making ....
e. According to .... , the element with .... atomic number is more abundant than that with .... atomic number.

من فضلك انظر فى الخلف

• **Question (3):**

I- On the basis of VBT predict the geometry of these complexes: $[Fe(CO)_5]$ & $[Ni(CN)_5]^{3-}$. **(10 marks)**

II- Which complex of the following pairs has the larger value of Δ_o &why **(10 marks)**

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

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

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

d. $[Rh(NH_3)_6]^{3+}$ & $[Ir(NH_3)_6]^{3+}$

e. $[Co(NH_3)_6]^{3+}$ & $[CoF_6]^{3-}$

• **Question (4):**

I- For the Fe^{2+} ion, the electron pairing energy (P) is about 17,600 cm^{-1} & the crystal field splitting energy values (Δ_o) for the $[Fe(H_2O)_6]^{2+}$ & $[Fe(CN)_6]^{4-}$ complexes are 10,400 cm^{-1} and 33,000 cm^{-1}, respectively.

a. Which of these complexes have high spin configuration?

b. Calculate the number of unpaired electron for each complex & then calculate the μ_s?

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

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

• Atomic number:

[Ti=22, Cr= 24, Mn = 25, Fe = 26, Co = 27, Ni = 28, Rh = 45, Ir = 77]

Good Luck

Dr. Rania R. Zaky

المستوى الرابع : كيمياء - كيمياء وبنات كيمياء وجيولوجيا - كيمياء كلية بيئية (ك ٤١٣)

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

Second term
4th level(Chem. Biology Geology and Botany)
Date:2-6-2012
Time allowed:2 hours
Full Mark:60 Marks

Answer the Following Questions

Q1) (24 marks)

a-Explain, with examples, the effect of toxic chemicals on enzymes.

b- Explain the biochemical effects of two only of the following :

(a) Carbon monoxide

(b) Nitrogen oxides

(c) Sulphur dioxide

(d) Cyanide

and suggest antidotes for each

c- Explain the mechanism of action of insecticides.

Q2) (24 marks)

a- Explain biochemical methylation and illustrate propagation of Hg in food chain

b- What are the broad categories of water pollutants? Discuss

c- Give a concise account of the chemical speciation of (two only

(a)Hg (b) Cu (c) Pb (d) As

in the environment

Q3) (12marks)

a- Define the following :

i) Trace elements ii) Heavy metals iii) speciation iv) BOD

b- Write short notes on:

(i) Sanitary landfill method for waste disposal

(ii) Incineration method of waste disposal

Best wishes

كيمياء ونبات - تكنولوجيا حيوية (ن ٤٢١)

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
Second Term: May 2012

Educational Level: Fourth Level **Program (Branch): Chemistry /Botany**
Subject: B (421) **Course(s): Biotechnology**
Time: 2 hrs **Date: 9 / 6 /2012** **Full mark:** 60 **Question mark: 20**

Answer the following questions:

Q1: " Overview of Plant Biotechnology from its early Roots to the Present". Briefly Discuss? (20 marks)

Q2: Summarize the following topic:
"New Developments in Agricultural and Industrial Plant Biotechnology". (20 marks)

Q3: Define each of the following:

a- Biobutane as an alternative fuel. (5 marks)

b- Biodiesel. (5 marks)

c- Biogas. (5 marks)

d- Biohydrogen. (5 marks)

Good Luck
Examiner
Prof. Mohammed Nagib

Examiners: Prof. Mahmoud El-Baz Younis Prof. Mohammed Nagib Abdel-Ghany Hasaneen

نبات وكيمياء - جغرافيا نباتية - طلاب مصرية (ب ٢٠)

Mansoura University
Faculty of Science
Botany Department

Final Examination in Botany
Second term: June 2012

Educational Year: Fourth Level **Program: Chemistry & Botany**
Subject: Bot. (420) **Course(s): Plant Geography – Flora &Plant Community**
Time: 2 hrs **Date: 5/ 6 /2012** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q.1 **Write in detail on <u>Two Only</u> of the following:** (20 marks)
A- The Deltaic Mediterranean coast of Egypt.
B- The habitat types and characteristic vegetation in the Egyptian Deserts.
C- The Red Sea coastal land of Egypt.

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- Write short notes on:
1. Theory of tolerance of plants. (5 marks)
2. Human dispersal. (5 marks)

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

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

المستوى الرابع كيمياء نبات - (بـ ٤١٩) تغذية معدنية وفسيولوجيا الكائنات الدقيقة

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
2nd Term: June. 2012

Educational Year: fourth Level **Program (Branch): Chem/Bot.**
Subject: Bot (419) **Course(s): Plant mineral nutrition and physiology of microorganisms.**
Time: 2 hrs **Date: /june 2012** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q1:	**Explain transport of mineral nutrients across plasma membranes and show how the carrier molecules can transport ions passively and actively. (20 marks)**
Q2:	**a- Write an account on occurrence, availability, functions and deficiency symptoms of P, K and Fe. (10 marks)** **b- I- Identify the regions of the growth curve in which (1) nutrients are rapidly declining and (2) wastes accumulate.** **II- Illustrate mechanism of growth in filamentous fungi. (10 marks)**
Q3:	**Discuss <u>each of the following:</u>** **i- The conditions influencing the effectiveness of antimicrobial agents.** **ii- Microbial metabolism of lactose.** **iii- The metabolic and structural adaptations for extreme temperatures of psychrophilic and thermophilic microorganisms. (20 marks)** **Examiners: Prof. M. A. Abbas** **Dr. Mervat H. Hussein**