المستوى الرابع - كيمياء نبات علم الإنزيمات والأيض (أ) م ٢٠١٤

Year: 4th Year General Bot.
Course: Enzymology

Botany Department
Faculty of Science
Mansoura University

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Answer the following questions:

Q1:i-Write down the reaction of the following enzymes:

i-alcohol dehydrogenase.ii-aldehyde dehydrogenase.iii-acyl-transferase.iv-deaminase.

ii-Complete the following enzymatic reactions:

a- $RC(=O)H + NH_2\text{-}CH_2R \longrightarrow$ ..... +.....

b- $RO\text{-}P(=O)(OH)\text{-}OH$ + ... ⟶ ROH + ...

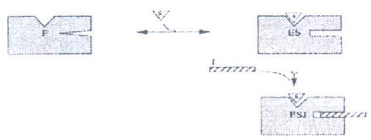
c- $RCH_2CH(NH_2)R \longleftrightarrow$ ..... + ...

Q2: i-Classify the enzymes which have the following EC:

i-EC 1.1.1.14 ii-EC 3.1.2.23 iii-EC 4.1.2.39

ii-Complete the following statements:

a- If the enzyme is an FAD- or NADH-dependent, it could be easily purified by ..... Chromatography.
b- Constitutive enzymes are .....
c- Heterodimer proteins contain ..... and in this case the active site is located at .....
d- Apoenzyme is ..... and the coenzyme is .....
e- The substrate would inhibit the enzyme when ..... because it forms .....
f- The symbol or arginine is ..... and for histidine is .....
g- The source for enzyme purification should be ....., ..., and .....



h- I-This figure shows ..... Inhibition and this is a type of ..... Inhibition
II-The inhibitor is binding to the enzyme at ..... with a ..... bond, when .....
III-The applications of enzyme inhibition are ..... and .....

Q3-i-Write on the following points:

a- The characteristics of the enzyme active site
b- The effect of Enzyme concentration on enzyme activity
c- The Tertiary structure of the enzymes
d- The induced fit model

ii-Give reasons for the following points:

a- The enzymes could not catalyze energetically unfavorable reactions
b- High Km values indicate low affinity
c- Enzymes are the life
i- Alpha helixes are formed

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Best wishes Prof. Hamed M El-ShoraDrAmr Mohammed

المستوى الرابع - كيمياء
كيمياء نبات كيمياء حيوية كيمياء الأطعمة ٤٢١ ك
كيمياء حيوية

Mansoura University
Faculty of Science
Chemistry Department
Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم الكيمياء
المنصورة – مصر

First Semester Term 2013/2014

Educational Year: 4th Year Chemistry, Bot. & Chem., Zool. & Chem.
Course (s): Photochemistry& Organic spectroscopy.
Date: 29/12/2013.
Course Code: CH 431.

Subject: Chemistry.
Full Mark: 60.
Time: 2 hrs.

A. Answer all the following questions

1)

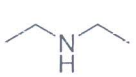
i. Explain carefully, what happen when electrons absorb photo energy? (5 Marks)

ii. Write short notes on Norrish type I for the photoreaction of carbonyl compounds and explain your answer by an example. (5 Marks)

iii. Write short notes on photochemical reaction of Type A of cyclohexenonc c. (5 Marks)

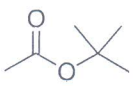
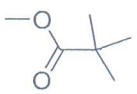
2)

i. How would you use ^{1}HNMR spectroscopy to distinguish between the following compounds: (5 Marks)

a.  and 

b.  and 

c.  and 

d.  and 

ii. There are three isomeric **dichlorocyclopropanes**. Their ^{1}HNMR spectra show one signal for isomer **A**, two signals for isomer **B**, and three signals for isomer **C**. Draw the structures of isomers **A**, **B** and **C**. (5 Marks)

iii. A signal has been reported to occur at 1200 Hz downfield from TMS in an NMR spectrometer with a 300 MHz frequency. (5 Marks)

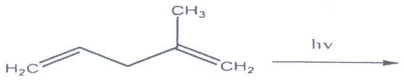
a) What is the chemical shift of the signal?
b) What would its chemical shift be in an instrument operating at 100 MHz?
c) How many hertz downfield from TMS would the signal be in a 100 MHz Spectrometer?

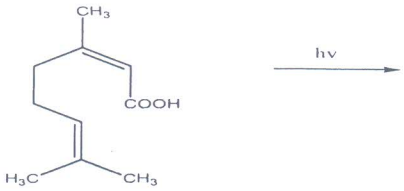
B. Answer only one of the following questions:

3)

i. Complete the following photochemical equations. (15 Marks)

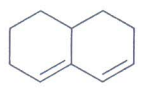
a. 

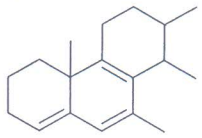
b. 

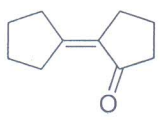
c. 

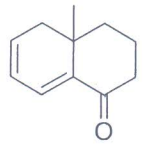
d. $Ph_2CH\text{-}CO\text{-}CH_2\text{-}CH_2\text{-}CH_3 \xrightarrow{h\nu}$

ii. Calculate λ_{max} for each of the following(7.5 Marks):

a. 

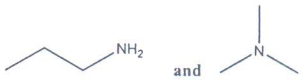
b. 

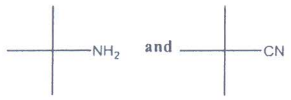
c. 

d. 

iii. How would you use IR spectroscopy to distinguish between the following compounds: (7.5 Marks)

a. 

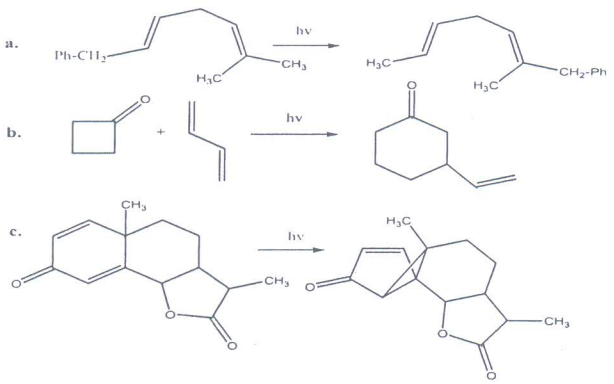
b. 

c. 

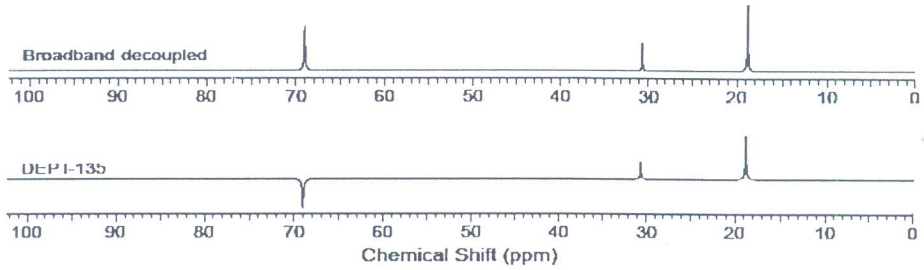
d. 

4)

i. Is the chemical structure of the product of the following equations right? If is it wrong, suggest the correct one. Write your suggestion mechanisms. (15 Marks)



ii. Determine the structure of an alcohol with molecular formula $C_4H_{10}O$ that exhibits the following ^{13}C NMR spectra. (7.5 Marks)

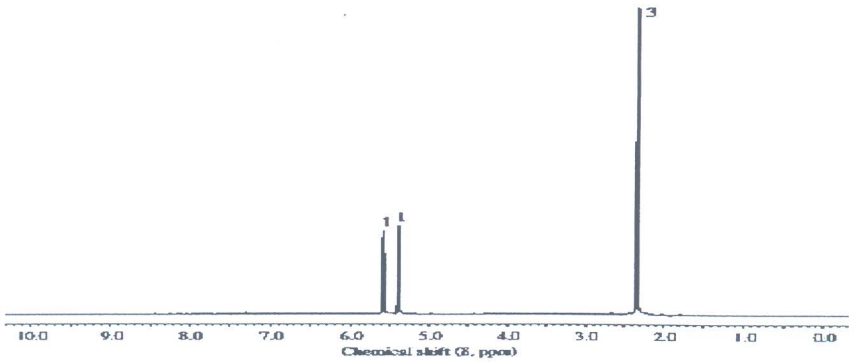


iii. Identify the C_3H_5Br isomers on the basis of the following information: (7.5 Marks)

i. Isomer A has three peaks in its ^{13}C NMR spectrum: δ 32.6 ppm (CH_2); 118.8 ppm (CH_2); and δ 134.2 ppm (CH).

ii. Isomer B has two peaks in its ^{13}C NMR spectrum: δ 12.0 ppm (CH_2) and δ 16.8 ppm (CH). The peak at lower field is only half as intense as the one at higher field.

iii. Isomer C has the ^{1}H NMR spectrum shown in the following Figure.



كيمياء نبات - التركيب الدقيق للخلية نواة خلوية ب ٤١٨

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany **First Term: Jan., 2014**

Educational Year: Fourth Level **Program (Branch): chem./ Botany**
Subject: (B 418) **Courses: Genetics and Cell Ultrastructure**
Time: 2 hrs **Date: 1 / 1/2014** **Full mark:** 60

Q1 A : Write short notes on the following (10 Marks):

1- Fine structure of cilia (Flagella). (3.5 Marks)
2- The fluid mosaic model of plasma membrane. (3.5 Marks)
3- Functions of Golgi bodies. (3 Marks)

B- Compare between the following (10 Marks):

1- Types of chromatin. (3.5 Marks)
2- Endocytosis and exocytosis. (3.5 Marks)
3- Types of arrangements of endoplasmic reticulum. (3 Marks)

Q2 A : Fill in the spaces using suitable words or phrases:(10 Marks)

1- ..... is a ribosome production factory.
2- ..... is responsible for the production of spindle fibers during cell division in animal cells.
3- The two types of enzymes localized in peroxisomes are ..... and .....
4- ..... communicate between the cytoplasm and nucleus.
5- The inner membrane of a chloroplast is composed of flattened sacs called ....., collectively these sacs are termed .....
6- The presence of chloroplast, cell wall and large vacuole are features that distinguishes .....
7- The inner membrane of mitochondria forms finger like projections termed ..... which are attached submicroscopic particles called .....

B: Compare between the following pairs : (10 Marks)

1- Sex-linked and sex-influenced inheritance
2- Incomplete dominance and codominance inheritance

Q3: Discribe all the following : (20 Marks)

1- Monohybrid test cross. (5 M.) 2- ABO Blood Group system (5 M.)
3- Recessive epistasis (5 M.) 4- Dominant epistasis (5 M.)

God help you

Examiners: Dr. Rehab A. Rizk Dr. Ashraf Elsayed

المستوى الرابع - كيمياء نبات - نظام بيئي وسيئة نباتية وتلوث ٢٠١٤

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
First Term: Jan. 2014

Educational Year: Fourth Level **Program (Branch): Botany / Chemistry**
Subject: Bot (417) **Course(s): Ecosystem-Ecology & Pollution**
Time: 2 hrs **Date: 1 /1 /2014** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q.1 **A- Write on each of the following:** (20 marks)

1- Principal ways species interact.
2- Phosphorus cycle.
3- Bases of classification of halophytes according to adaptability to salinity.
4- Types of species found in ecosystems.

Q.2 **A- Give short note on the following:** (10 marks)

1- Basic Functional Components.

2- Classification of xerophytes.

B- Complete the following:- (10 marks)

1- The sediment covers ……., ……., introduces ……., ……. Change ……., decrease …….
2- Garbage can be defined as ……..
3- Nutrients, such as ……. and ……. are substances needed for ……., but elevated levels can ……. which can lower ……. in water.
4- Toxic chemicals are ……..
5- Soil pollutants can be classified into ……., ……., …….
6- Thermal pollution increase ……. and …….

Q.3 **A- Write on each of the following:** (10 marks)

1- Photochemical products.
2- Some of the important disease caused by air pollutants to plant.

B- Explain the ecological balance and its destroying in nature streams. (5 marks)

C- Describe the impacts of physical water pollution. (5 marks)

Examiners: **Dr. Ghada El-Sherbeeny** **Dr. Yasser El-Amier**

٤ كيمياء نبات - فطريات ومقاومة الأمراض وعلاقة العائل بالطفيل م ٤١٥

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
First Term: Jan. 2014

Educational Year:2013- 2014 **Program (Branch):**Botany and Chemistry
Level4
Subject:Botany **Course(s):**Mycology and phytopathology (B415)
Time: 2 hrs **Date: 12 /1 /2014** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q1: Give an account on each of the following:

- a- **Essential considerations of plant disease management (5 marks)**
- b- **Identification of Etiolation , Hypertrophy, Epidemiology, Variegation and Symptoms (5 marks)**
- c- **Classification of plant diseases (5 marks)**
- d- **Disease control by Exclusion of the pathogen (5 marks)**

Q2 : Using illustrative diagrams describe each of the following:

- a- **Pectinases as pathogen weapon (6 marks)**
- b- **Direct penetration of intact host surfaces (4 marks)**
- c- **Histological defense structures (6 marks)**
- d- **Hypersensitive response(HR) as a defense mechanism (4 marks)**

Q3 : Give an account on each of the following:

- a- **Koch's postulates (4)**
- b- **Infected host as a reservoir of inoculum (6)**
- c- **Disease triangle (6)**
- d- **Factors that adversly affect normal plant functions (4)**

Examiners :

Prof. Salah El-Dohlob **Dr. Hoda Soliman**

المستوى الرابع - كيمياء وحيوان - كيمياء السطوح الطيف الجزيئي ك ٤٤٥
كيمياء نبات

Mansoura University Faculty of Science Chemistry Department Subject :Physical Chemistry Course(s): Spectroscopy and Surface chemistry (Chem 445)	كلية العلوم جامعة المنصورة	First Term Date : Jan 2014 Time Allowed : 2 hours Full Marks : 60 Marks

Section (A) Chemical Spectroscopy (30 Marks)

1.a) Write on :Types of rotating molecules - angular momentum for rotation- - determination of moment of inertia and bond length for rotational spectra .

(10 Marks)

b) Pure microwave absorption at 84.421, 90.449 and 96.477 GHz on flowing dibromine gas over copper metal at 1200K.What transitions do these frequencies represent. (5 Marks)

2. a) Explain the vibration spectra of water and $-CH_2$ group. (9 Marks)

b) The microwave spectrum of HBr shows a series of lines separated by 3.538 cm^{-1}. Calculate the moment of inertia and the internuclear distance in the molecule. ($h=6.62\times10^{-27}$ erg .S, $N_A = 6.02\times10^{23}$,atomic weights : H= 1,Br = 80). (6 Marks)

SECTION (B) (Surface chemistry) (30marks)

1- Two capillary tubes with inside radii 0.6 and 0.4 mm are inserted into a liquid with a density 0.901g/cm^3. The difference between the capillary raises in the tubes 1.0 cm. Find γ. Assume a zero contact angle. (4marks)

2- Define the following: (i) Kelvin effect ii) Spreading coefficient (iii) Parachor iv) Surfactant (4marks)

3- Explain the drop weight methods for the surface tension determination (4marks)

بقية الإختبار خلف الصفحة

Prof.Dr. Esam Arafa Prof.Dr. Salem Samra

4- The linear representation of Langmuir isotherm gives S=0.001 and I=0.015 $mol.g^{-1}$, calculate the monolayer capacity and adsorption coefficient. **(4marks)**

5- From the linear representation of Fruendlich isotherm, identify the slop and intercept. **(4marks)**

6- Write the equation of Ramsay and discuss the value of constant K **(2marks)**

7- The linear representation of BET isotherm gives S=0.002 and I=0.025 $mol.g^{-1}$, calculate the adsorption enthalpy

(vaporization enthalpy= 5.6 KJ/mol, R = 8.314 J/mol.K) **(4marks)**

8- i- By using ring method we can determine..... **(4marks)**

a) Surface tension only
b) Interfacial tension only
c) Both surface&interfacial tensions
d) Relative surface tension

ii- The unit of parachor is,

a) $(cm^3/mol)\ (erg/cm^2)^{1/4}$
b) $(cm^3/g)\ (J/cm^2)^{1/4}$
c) $(g/mol)\ (N/m)^{1/4}$
d) no unit

iii- Langmuir postulate of monolayer correct for physisorption at

a) - High T and low P
b) - High P and low T
c) - High T and high P
d) - Low T and low P

iv- When c>1, the isotherm predominate

a) - Type II
b) - Type III
3- Any type of them