المستوى الرابع - كيمياء نبات - كيمياء ضوئية وكيمياء الطيف ٢٠١٢

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

جامعة المنصورة
كلية العلوم
قسم الكيمياء
المنصورة – مصر

Educational Year: 4th Year Chem. Botany& Chem. Zoology.
Course (s): Photochemistry& Organic spectroscopy.
Date: 29/12/2012.
Course Code: CH 431.

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

Answer the following questions

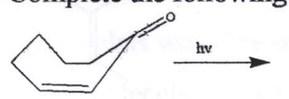
1.

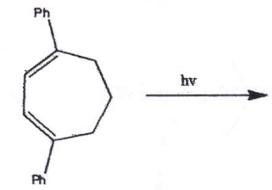
a) Write brief account on (Fluorescence – Phosphorescence – Intersystem crossing). (7.5 Marks)

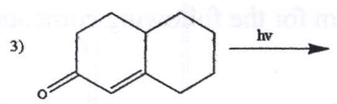
b) Write on cyclisation reactions of conjugated olefins and explain your answer by examples for each. (7.5 Marks)

2.

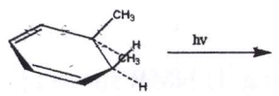
a) Complete the following photochemical equations. (7.5 Marks)

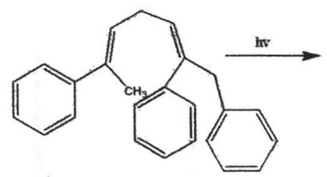
1) 

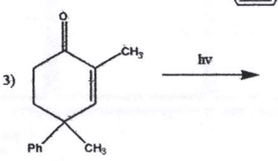
2) 

3) 

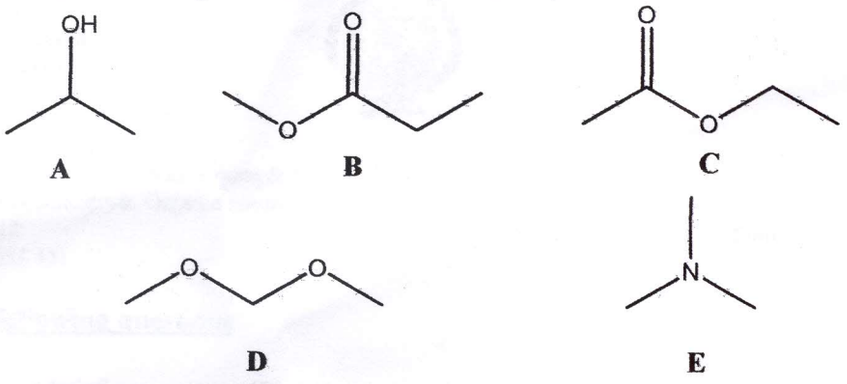
b) Complete and suggest the suitable mechanism for the following equations. (7.5 Marks)

1) 

2) 

3) 

b. Consider the following molecules, **A – E** (10 Marks):.

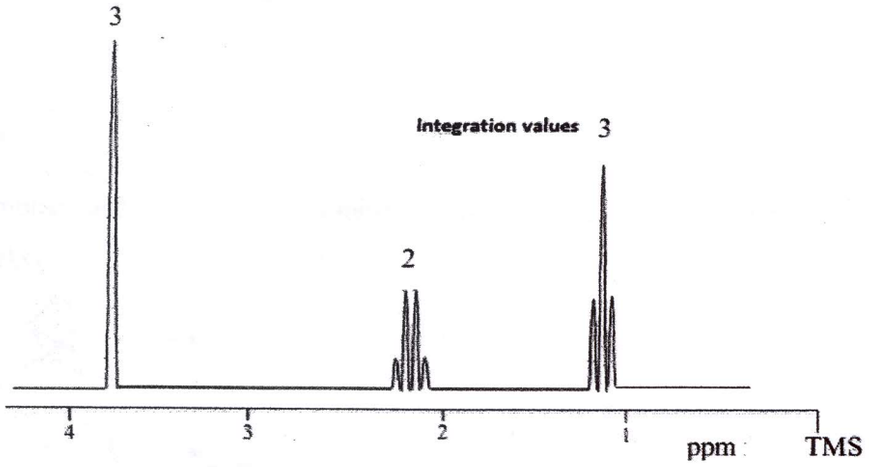


A **B** **C**

D **E**

More than one answer may be correct. <u>GIVE ALL CORRECT ANSWERS.</u>

1) Which of the molecules would give three signals in the ^{1}H NMR spectrum?
2) Which of the molecules would possess a ^{1}H NMR spectrum consisting of only one signal?
3) Which of the molecules would possess a ^{1}H NMR spectrum consisting of two signals in the ratio 1:3?
4) How many singlets would be observed in the ^{1}H NMR spectrum of **D**?
5) Which of the molecules would possess a ^{1}H NMR spectrum containing a singlet, a triplet, and a quartet signal?
6) Examine the ^{1}H NMR spectrum below. To which of the compounds does it belong?



Examiners

Prof. Dr. Mohamed Abou-Elzahab **Dr. Saad Shaaban**

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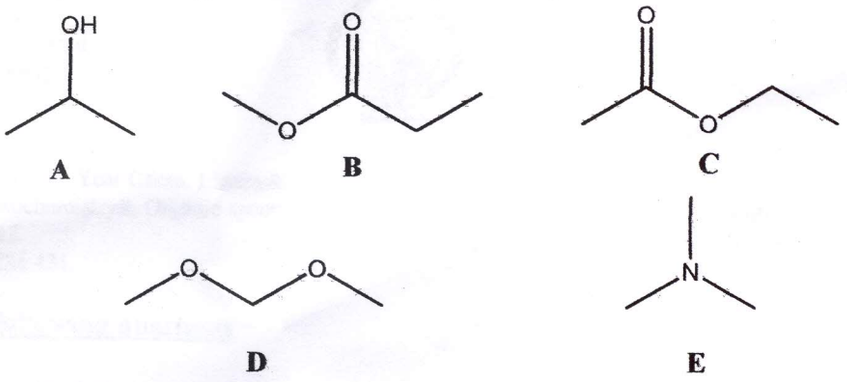

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D **E**

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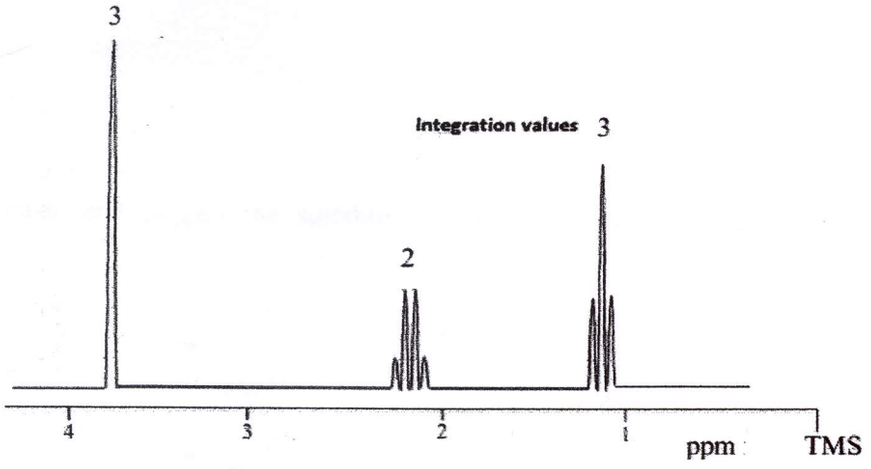

Examiners

Prof. Dr. Mohamed Abou-Elzahab **Dr. Saad Shaaban**

Mansoura University
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Botany Department
El-Mansoura, Egypt

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Final Examination in Botany
First Term: Jun. 2013

Educational Year: Third Level **Program (Branch): Biology**
Subject: Bot (417) **Course(s): Botany/ Chemistry**
Time: 2 hrs **Date: 1 / 1 /2013** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q1: A- Complete the following:- (10 M)

1- The physical factors having the greatest effect on the terrestrial ecosystem are: ……..… , ……..
2- The simplest and easy methods of soil reclamation may be achieved in ……..……
3- Humus is……
4- ……..….. are serves as an early warning that an ecosystem is being degraded.
5- …… and …… from natural causes that change the ecosystem.
6- In agriculture, acid soil is treated with……... while alkali soil is improved by addition of……
7- The major reservoir for phosphorus is ……for plants.
8- Soil may be classified according to the content of organic matter into……..and ……
9- …… is the process in which elements, chemical compounds, and other forms of matter are passed from one organism to another and from one part of the biosphere to another.

B- Write on <u>Two Only</u> of the following: (10 M)

1- Basic functional components.
2- Effect of saline soil on plants.
3- Importance organic matter.

Q2: A- Mark the wrong (X) and the correct (√) sentences of the following: (6 M)

1- The process of granulation affectes soil structure and aeration.
2- The food web of any community depends on live producers and detrivores.
3- Soil quality is the major determinant of plant distribution and growth.
4- Rainfall and drainage are changing the concentration of soil solution.
5- Humid climate favours alkaline soils while arid zones acidic soils are favoured.
6- Salts like gypsum and chalk are very soluble and do not harm crops.

B- Elucidate with drawing <u>only</u> of the following: (4 M)

1- Phosphorus cycle 2- Nitrogen cycle

C- Compare between :-

1- Stationary and mobile source of air pollution. (1.5 M)
2- Garbage and rubbish. (1.5 M)

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

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

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D-Complete the following:-

1- Atmospheric pollution is …….. (1 M)

2- Pollution from wastes without weight (energy waste) include ……., ……. and ……. (1.5 M)

3- Persistent organic compounds are danger because ……., ……. and ……. (1.5 M)

4- The greenhouse effect is ……. (1 M)

5- Excess organic matter addition to water cause excess ……. which leads to …….. and ……. (1.5 M)

6- Secondary pollutants can be defined as ……. (0.5 M)

Q3: A- Write on three of the following: (8 M)

1- Sedimentation and its impacts.
2- Bad ozone illustrating its presence.
3- Nutrients pollution of water.

B- Classify primary pollutants of air explaining particular matter. (6 M)

C- Describe effects of air pollutants on vegetation. (6 M)

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

المستوى الرابع - كيمياء ونبات - التحليل الضيق والتحليل الكهربي ٢٠١٥

Mansoura University
Faculty of Science
Chemistry Department
Subject: Analytical Chemistry
Course: **electroanalytical and Spectrometry .....**
Course code: 314 ..415

4th level(Chemistry students)
Date:5-1-2013
Time allowed: **2** hours
Full Mark:**80** Marks

Answer the Following Questions

A-**Spectrometry** (~~40~~ marks)

1-What is colourimetry ? what are the basic components of single and double beam spectrophotometer .

2-How can analyse a coloured compound by spectrophotometric method .

3 - what are the types of emission spectra . Discuss

a- absorption or emission b- nonradiative relaxation c- Fluorescence

4-If a 3.9x10-4 M solution of compound A (Molecular weight = 122) exhibited an absorbance of 0.624 at 238nm in a 1- cm cuvet .A blank had an absorbance of 0.029 .The absorbance of the unknown solution of compound A was 0.375 at the same wavelength .Find the concentration of A in the unknown expressed in g/l .

5- How can choice the method of analysis between the following techniques

i) Turbidometry . ii) Nephelometry .

what are the differences between Nephelometry and Fluorimetric techniques .

6- Explain how atomic spectroscopic methods are categorized based on the type of atomization process . Explain shortly the type of interferences in flame AAS and the ways their elimination .

Answer ALL Question only and express your answer by equation, diagram: with formula ,equation ,figures whenever possible

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Section Electro-analytical chemistry (40 marks)

1-a)Define *5 only* of the following : (10 marks)

1- Faraday 's 2nd law , α (conductance) **2-i_d. &i_p** **3- E_{cell} & E_j** 4-Cyclic voltammetry 5- Back titration in Coulometry with control potential 6- Anodic stripping analysis 7-$E_{1/2}$ & $\Delta E_{1/2}$. 8-Λ_{eq} & Kohlrauch law

b) Discuss *2 only* of the following sentences: (10 marks)

1-Electro-deposition depend on several factors& has many applications.

2 -Dropping Hg electrode has many advantages & polarography analyses very useful in analytical chemsitry ,O_2 removed from analytic solution in polarographic cell .

3-Ions – molecular selective electrode are versatile.

c) A mineral sample 500.0 mg containing stibnite Sb_2S_3 is decomposed and dissolved in acid and diluted to 100 ml .A 5.0 ml aliquot is added to 150 ml of an electrolyte containing 2 M HCl and 0.2 M KBr. Electro-generated bromine oxidizes Sb^{+3} to Sb^{+5} and the coulometric titration requires 200.0 sec. At 50.0 mA to reach the end point signal . Calculate the % of Sb & Stibnite Sb_2S_3 in the sample. (At. Wt. Sb =122, S = 32). : (10 marks)

d) complete 4 only the following: (10 marks)

1- **$E_{1/2}$= .....for E_c = -0.66 v. and E_a = -0.64 v. and the number of electrons=.... for organic compound (cyclic voltammetry).**

2- **Controlled potential coulometry used for analysis of .....and determine no of .....**

3- **Using coulometry with constant current for determination of ..... and produce .....**

4- **Equivalent conductance Λ° are .....and depends on ..... while Λ° is .....**

5- **Quantitative analysis in polarography technique depends on ..... using .....and ..... methods. while, qualitative analysis depends on .....**

Good Luck : prof. Dr. I. Kenawy

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

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Final Examination in Botany
First Term: Jan. 2013

Educational Year:2012- 2013 **Program (Branch):**Botany and Chemistry
Level4
Subject:Botany **Course(s):**Mycology and phytopathology (B415)
Time: 2 hrs **Date: 12 /1 /2013** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q1: Give an account on each of the following:

a- General principles of plant disease management (5 marks)
b- Identification of Abscission, Hyperplasia, Epidemiology, Host range and Syndrome (5 marks)
c- Classification of plant diseases (5 marks)
d- Mechanisms of biological control (5 marks)

Q2 : Using illustrative diagrams describe each of the following:

a- Essential components of an epiphytotic (disease triangle) (6 marks)
b- Methods of penetration and invasion by fungi (4 marks)
c- Histological defense structures (6 marks)
d- Cellular defense structures (4 marks)

Q3 :

a- Compare and contrast between each of the following:
   1- Soil inhabitants and soil invaders (5 marks)
   2- Host specific and non host specific toxins (5 marks)
b- Write an account on each of the following:
   1- Koch's postulates (4 marks)
   2- Seed as the source of autonomous dispersal (6 marks)

Examiners :

Prof. Ebraheem Mashaly **Dr. Hoda Soliman**

Mansoura University
Faculty of Science
Chemistry Department
Course: Physical Chemistry
Date : 15/ 01/ 2013

First term Examination
Subject: physical chemistry
Fourth Level
Full Mark : 60 Marks
Time Allowed : 2hours

Answer the Following Questions:

Section (A) Chemical Spectroscopy (30 Marks)

1.a) Write on :symmetric tops rotating molecules - angular momentum for rotation- interaction of radiation with rotating molecules -determination of moment of inertia and bond length for rotational spectra - rotation period **(10 Marks)**

b) Explain Hook's law and derive the fundamental frequencies for one paricle and two particles vibrating molecules . **(5 Marks)**

2. a) Explain the vibration spectra of CO_2 and $-CH_2$ group. **(9 Marks)**

b) The microwave spectrum of HBr shows a series of lines separated by 3.228 cm^{-1}. Calculate the moment of inertia and the internuclear distance in the molecule. **(6 Marks)**

($h=6.62\times10^{-27}$ erg .S, $N_A = 6.02\times10^{23}$,atomic weights : H= 1,Br = 80).

Section (B) Surface Chemistry (30 Marks)

Q1- **Choose the Correct answer** **(15 Mark, one mark for each)**

1. During the adsorption of Krypton on activated charcoal at low temperature

(A) $\Delta H < 0$ and $\Delta S < 0$
(B) $\Delta H > 0$ and $\Delta S < 0$
(C) $\Delta H > 0$ and $\Delta S > 0$
(D) $\Delta H < 0$ and $\Delta S > 0$

2. The extent of adsorption of a gas on a solid depends on .....

(A) Temperature of the gas
(B) Pressure of the gas
(C) Nature of the gas
(D) All are correct

3. Which of the following characteristics is not correct for physical adsorption?

(A) Adsorption on solid is reversible.
(B) Adsorption is spontaneous.
(C) Adsorption increases with increase in temperature.
(D) Both enthalpy and entropy of adsorption are negative.

4. The work done in blowing a soap bubble of radius R is W_1 and that to a radius 3R is W_2. the ratio of work done is

(A) 1:3
(B) 3:1.
(C) 1:9
(D) 9:1

5. Rain drops are spherical in shape because of

(A) Surface tension
(B) Capillary
(C) Downward motion
(D) Acceleration due to gravity

6. The rise of a liquid in a capillary tube does not depend upon

(A) Angle of contact **(C)** Radius of the capillary tube
(B) Density of the liquid **(D)** Atmospheric pressure

7. The height of water in a capillary tube of radius 2 cm is 4 cm. what should be the radius of capillary, if the water rises to 8 cm in tube?

(A) 1 cm **(B)** 0.1 cm
(C) 2 cm **(D)** 4 cm

8. **Surfactants when present in a medium at low concentrations it called .....**

(A) micelles **(B)** amphiphiles
(C) *Surface active agent* **(D)** monomer

9. The surface of water in contact with glass wall is

(A) Plane **(B)** concave
(C) convex **(D)** Both 'b' and 'c'

10. Spreading of liquid on solid will occur if the work of adhesion is ..... the work cohesion

(A) > (B) <
(C) = (D) none of these

11. Surface tension may be defined as

(A) The work done per unit area in increasing the surface area of a liquid under isothermal condition
(B) The work done per unit area in increasing the surface area of a liquid under adiabatic condition
(C) The work done per unit area in increasing the surface is of a liquid under both isothermal and adiabatic conditions.
(D) Free surface energy per in it volume

12. The surface tension for pure water in a capillary tube experiment is

(A) $\frac{3g}{2hr}$ **(B)** $\frac{3}{hr\rho g}$

(C) $\frac{r\rho g}{2h}$ **(D)** $\frac{hr\rho g}{2}$

13. The height of a liquid in a fine capillary tube

(A) Increases with an increase in the density of a liquid
(B) Decreases with a decrease in the diameter of the tube
(C) Decreases with an increase in the surface tension
(D) Increases as the effective value of acceleration due to gravity is decreased

14. Rate of physisorption increases with

(A) Decrease in temp. **(C)** Decrease in pressure
(B) Increase in temp. **(D)** Decrease ion surface area

15. The equation of parachor is:

(A) $\frac{M}{D}\gamma^{1/8}$ (B) $\frac{M}{D}\gamma^{1/2}$

(C) $\frac{M}{D}\gamma^{1/6}$ (D) $\frac{M}{D}\gamma^{1/4}$

Q2- **Answer the following** **(15 Mark)**

1. *The adsorption data of gas on solid surface is represented as (P/V) against P, gives straight line with a slope = 0.0159cm^{-3}/g & intercept = 2.3torr.cm^{-3}.g , calculate the surface area of the solid (cross-sectional area of the gas molecule = 14.8x10^{-20}m^2* **(3 Mark)**

2. *The density of acetone is 0.791 at 20°C. If the parachor value of C, H,O , C = O bond is 7.2, 16.2, 20.0 and 23.2 respectively, then find out the surface tension of acetone.* **(4 Mark)**

3. *In the Du Nouy tensiometer, if the diameter of the ring is 1.0 cm and the force needed to pull the ring up (with the liquid attached to the outer and inner periphery of the ring) is 6.77 mN, what is the surface tension of the liquid?* **(3 Mark)**

4. *Mention only the equation of the following* **(5 Mark)**

   a- *Fowkes equation*
   b- *BET equation*
   c- *langmuir equation*
   d- *Work of adhesion & work cohesion*

With my Best wishes **Prof. Dr. Esam Gomaa**

Dr. Shady El-Dafrawy **Dr. Amr Awad**