Mansoura University	**Final Examination**
Faculty of Science	**Subject: Chemistry (445)**
Chemistry Department	**Fourth level**
Course: Physical Chemistry	**Full Mark : 60 Marks**
Date : Jan. 2012	**Time Allowed : 2hours**

Section (A) Chemical Spectroscopy (30 Marks) الامتحان في صفحتين

1.a) Write on details on the different types of molecules according to their pure rotation spectra.(7.5 Marks)

 b) Explain: Reduced mass –angular momentum for rotational spectra and force constant . (7.5 Marks)

2. a) Explain the vibrational spectra of water molecules. (7.5 Marks)

 b) The microwave spectrum of HCl shows a series of lines separated by 2.828 cm^{-1}. Calculate the moment of

 inertia and the internuclear distance in the molecule. (7.5 Marks)

 (h=6.62×10^{-27} erg .S, $N_A = 6.02 \times 10^{23}$, atomic weights : H= 1, Cl = 35.5).

Section (B) Answer the Following Questions: (30 Marks)

I- Choose the response answer: (10 mrks)

1- Chemical adsorption is

 a) exothermic b) irreversible c) favored by high temperature d) all of these

2-The extent of physisorption

a) decrease with rise in temperature b) increases with rise in temperature

c) independent of temperature d) first increases and then decreases with rise in temperature

3- The curve indicating the variation of adsorption with temperatue at constant pressures known as

 a) adsorption isotherm b) adsorption isobar c) adsorption isostere

4- When there are no external forces, the shape of a liquid drop is determined by

(a) Surface tension of the liquid (b) Density of liquid (c) Viscosity of liquid (d) Temperature of air only

5- The rise of a liquid in a capillary tube does not depend upon

(a) Angle of contact (b) Density of the liquid (c) Radius of the capillary tube (d) Atmospheric pressure

6- At critical temperature, the surface tension of a liquid

(a) Is zero (b) Is infinity (c) Is the same as that at any other temperature (d) Can not be determined

7- Nacl dissolved (added) in to water than it surface tension is

(a) Decreases (b) Increases (c) Remains same (d) All of these

8- Excess pressure inside a soap bubble is

(a) Inversely proportional to its radius (b) Directly proportional to its radius

(c) Directly proportional to square roots of its radius (d) Independent of its radius

9-Point out the correct statement
   (a) Freundlich equation is valid over a limited range   of pressure. (b) The constants K and n vary with temp.
   (c) Freundlich adsorption equation is purely empirical formula   (d) All of the above

10- 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 init volume

II Answer the fllowing questions: (20 marks)

1- Write on the following:-1
 a-The Ring method used for measuring surface tension .
 b-The Kelvin equation and Kelvin effect.

2 why is surface tension of water greater than surface tension of oil.

3- Explain why water rises while mercury falls in a capillary tube.

4-.Determine the surface tension of ethyl alcohol if The density of ethyl alcohol is 0 .789 g/cm^{-3} and values of
    atomic parachor are of O=19.8,C=9.0,H=15.5
5-The adsorption of a gas on a solid surface was found to follow a Langmuir isotherm with $b = 3.76$ kPa^{-1} at a
    temperature of 25°C. Determine the pressure of gas required to achieve a fractional surface coverage of 10%.

Examiners : Prof. Dr. Esam Gomaa   and Sohier Abd El- Hakam

2

Mansoura University
Faculty of Science
Chemistry Department
Course(s): Photochemistry& Organic
spectroscopy (CH 431)

First term
4th Year, Chem. Botany & Chem. Zoology Students.
Date : 17 / 01 / 2012.
Time Allowing : 2 Hours
Full Mark: 60

كلية العلوم
جامعة المنصورة

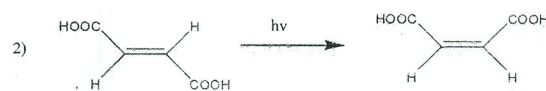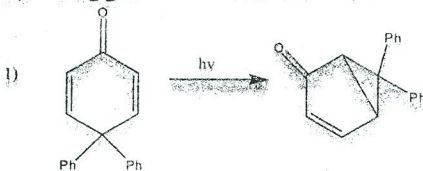## Answer the following questions

1.

    a) Write brief account on Jablonski diagram. (7.5 Marks)

    b) Write short notes on Norrish type II for the photoreaction of carbonyl compounds and explain your answer by an example. (7.5 Marks)

2.

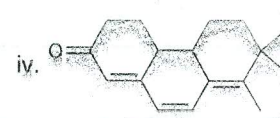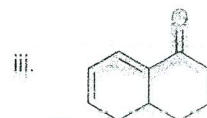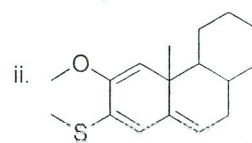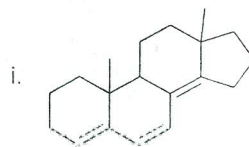   a) Complete the following photochemical equations. (7.5 Marks)
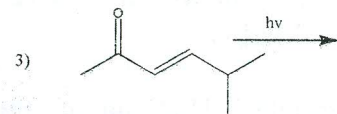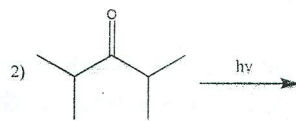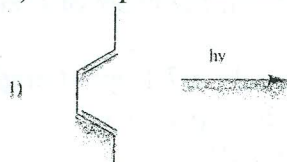
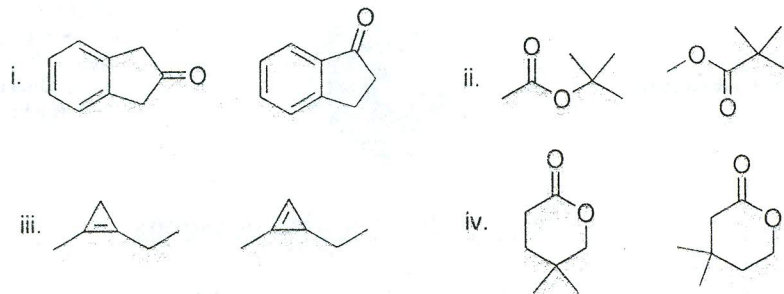   b) Suggest the suitable mechanism for the following equations. (7.5 Marks)

3.

a) Calculate λ_{max} for each of the following(5 Marks):

b) How would you use ^1HNMR spectroscopy to distinguish between the following compounds (5 Marks):

i. [structures] ii. [structures]

iii. [structures] iv. [structures]

c) Illustrate with examples the observed fragmentation pattern in mass spectrometry of (5 Marks):

    i. Alcohols.   ii. Ketones.

4.

a) Deduce the structure of each of the following compounds on the basis of their ^{1}H NMR spectra and molecular formulas(5 Marks):

    i. C_8H_{10}; δ 1.2 ppm (triplet, 3H), δ 2.6 ppm (quartet, 2H), δ 7.1 ppm (singlet, 5H).

    ii. $C_{10}H_{14}$; δ 1.3 ppm (singlet, 9H), δ 7.0 to 7.5 ppm (multiplet, 5H).

    iii. C_6H_{14}; δ 0.8 ppm (doublet, 12H), δ 1.4 ppm (heptet, 2H).

    iv. $C_4H_6Cl_4$; δ 3.9 ppm (doublet, 4H), δ 4.6 ppm (triplet, 2H).

b) A compound with molecular formula $C_{10}H_{10}O_4$ produces a ^{1}H NMR spectrum that exhibits only two signals, both singlets. One signal appears at 3.9 ppm with a relative integration value of 79. The other signal appears at 8.1 ppm with a relative integration value of 52. Identify the structure of this compound. (5 Marks)

c) Predict the structure of a compound of molecular formula $C_5H_{10}O$ having the following IR and ^{1}HNMR data: (5 Marks)
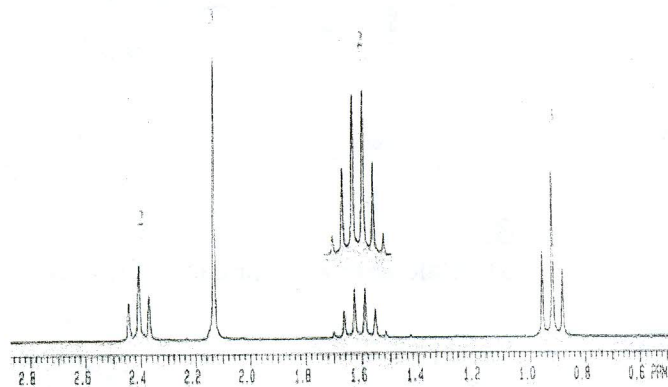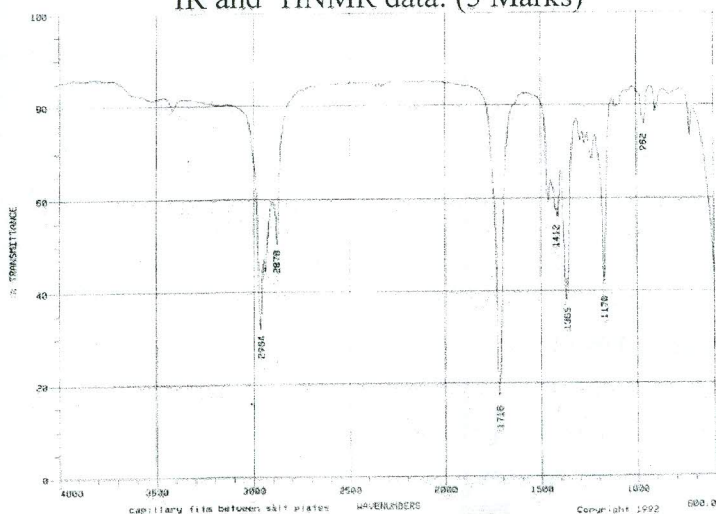
Examiner

Prof. Dr. M. Abou-Elzahab
Dr. Saad Elden Elaraby

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة ـ مصر

Final Examination in Botany
First Term: Jan. 2012

Educational Year: 2012   **Level 4**   **Program (Branch):B. Ch.**
Subject:Botany   **Course(s):Mycology and phytopathology**
Time: 2 hrs   Date: 14 /1 /2012   Full mark: 60   Question mark: 20

Answer the following questions:

Q1: I- fill in the spaces using the correct words (10 marks):

a-...(1)...is a plant that can make its own food through photosynthesis while ...(2)...are organisms that gain their food by digesting dead organic material.

b-...(3)...is a condition of being diseased while...(4)...is having the characteristics of a pathogen and ...(5)...is the capability of a pathogen to cause a disease.

c-...(6)...is a pathogen of biotic origin which is called ...(7)...when it can cause disease and if it is...(8)...it does not cause severe disease.

d-The...(9)...is the sequence of distinct events occur in succession and leads to the development of the disease while ...(10)...is the process by which pathogens establish contact with the susceptible cells or tissues of the host and procure nutrient from them.

II-Give an account on each of the following:
   a- Factors that adversely influence plant meristematic activity (5 marks)
   b- General principles of plant disease management (5 marks)

Q2 : Using illustrative diagrams describe each of the following:
   a- The role of pectic enzymes in pathogenesis (5 marks)
   b- Direct penetration through intact plant surfaces (5 marks)
   c- Histological defense structures (5 marks)
   d- Hypersensitive response (5 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- Mechanisms of biological control (5 marks)
            2- Essential conditions for an epiphytotic (5 marks)

Examiners :

Prof. Salah El- Dohlob   Dr. Hoda Soliman

ده كيميا, نبات , (س٤١٣) علم لأنـزيمات والميس

Answer the **three** questions

Question 1

A-**Mark** each of the following statements with (Yes) or (No):   (10)

(1) Urease breaks down urea into $H_2O + NH_3$.   (..........)

(2) Alcohol dehydrogenase is cytosolic enzyme.   (..........)

(3) Pyruvate dehyrogenase is mitochondrial enzyme   (..........)

(4) Aconitase belongs to ligases.   (..........)

(5) Asparagine synthetase is classified under amidases.   (..........)

(6) V_{max} is an indicator for the affinity of substrate to the enzyme.   (..........)

(7) Succinate could be converted to fumarate by fumarase.   (..........)

(8) Amylose contains 1,4-linkage and 1,6-linkage.   (.......)

(9) Pyruvic acid could be converted to acetaldehyde by pyruvate carboxylase. (…).

(10) Ligases link two molecules in absence of adenosine compound. (….).

B-**Write** shortly on Pentose Shunt (Mention the reactions).   (10)

Question 2

A-**Write** the complete equations and the enzymes involved in each of the following: (10)

(1) C_3...$C_2 + C_1$

(2) $C_4 + H_2O$ ....$C_4 + NH_3$

(3) $C_5 + C_3$ (keto acid) .... $C_5 + C_3$ (amino acid)

(4) C_4...................................... $C_3 + C_1$

(5) $C_4 + NADP$......................$NADPH + C_1 + C_3$

B-**Write** the chemical reactions catalyzed by: (10)
  (i) Glutamine synthetase
  (ii) Phosphoglyceromutase.

Question 3

Discuss briefly each of the following:

a-Biosynthesis of fatty acids and the following reactions to give fat.   (10)

b-Fixation of CO_2 into sugars in C_3 Plants.   (10)

....

Best wishes

Prof. Hamed M. El-Shora   *Prof. Samy Abo-Alkasem*