

المستوى الرابع - كيمياء نبات
كيمياء حيوية - كيمياء لطيف لـ (٤٣١)
كيمياء صناعية
كيمياء

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)

- Explain carefully, what happen when electrons absorb photo energy? (5 Marks)
- Write short notes on Norrish type I for the photoreaction of carbonyl compounds and explain your answer by an example. (5 Marks)
- Write short notes on photochemical reaction of Type A of cyclohexenone c. (5 Marks)

2)

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

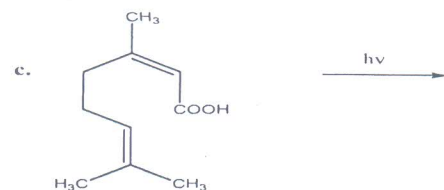
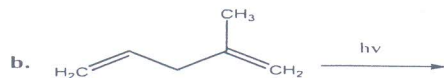
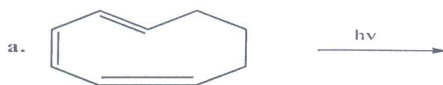


- There are three isomeric **dichlorocyclopropanes**. Their ¹HNMR spectra show one signal for isomer **A**, two signals for isomer **B**, and three signals for isomer **C**. Draw the structures of isomers **A**, **B** and **C**. (5 Marks)
- A signal has been reported to occur at 1200 Hz downfield from TMS in an NMR spectrometer with a 300 MHz frequency. (5 Marks)
 - What is the chemical shift of the signal?
 - What would its chemical shift be in an instrument operating at 100 MHz?
 - How many hertz downfield from TMS would the signal be in a 100 MHz Spectrometer?

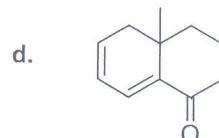
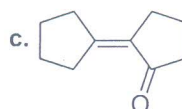
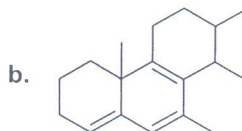
B. Answer only one of the following questions:

3)

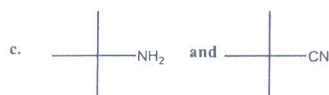
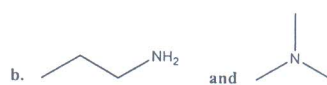
i. Complete the following photochemical equations. (15 Marks)



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

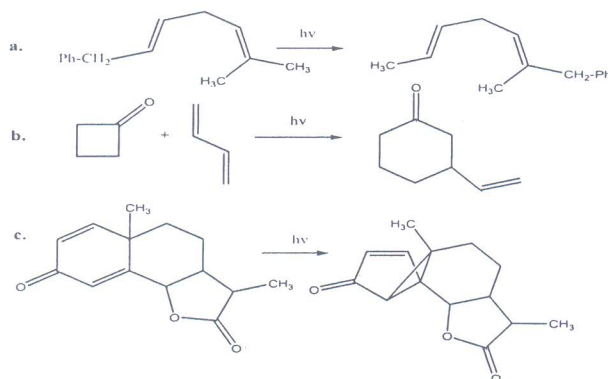


iii. How would you use IR spectroscopy to distinguish between the following compounds: (7.5 Marks)

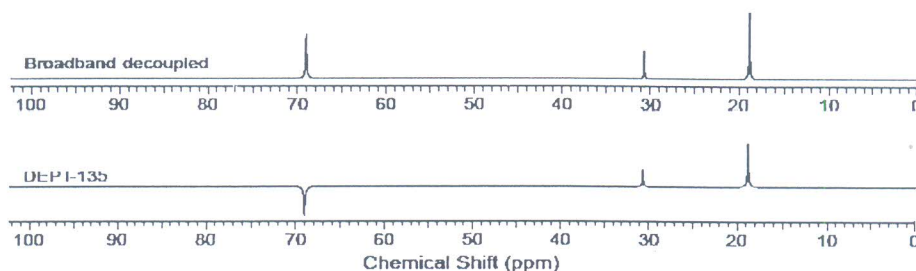


4)

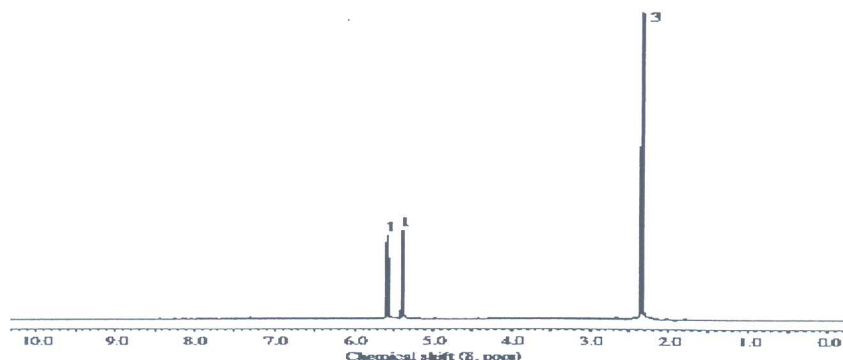
- i. Is the chemical structure of the product of the following equations right? If it is wrong, suggest the correct one. Write your suggestion mechanisms. (15 Marks)



- 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)
- 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).
 - 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.
 - Isomer C has the 1H NMR spectrum shown in the following Figure.



University of Mansoura
Faculty of Science
Zoology Department



جامعة المنصورة
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First Term Examination (January 2014)

Educational year: Fourth Level

Course: Environmental pollution and Biological

Program: Chemistry/Zoology

analysis (Z405) (Optional)

Date: 1 January 2014

Time: 2 hours

Full Mark: 80 Marks

Q1: Discuss with details (only three) of the following topics

[30] Marks

1. Femtochemistry and the environmental and medical applications of femtosecond
2. Methods of sample preparation in bioanalysis
3. Biomarker, bioindicator and bioassay
4. Ecosystem function with a reference to biogeochemical cycles

Q2- Choose the alien word(s):

[20] Marks

1. fitness – biomarker – biodiversity – bioanalysis – animal density
2. thermal pollution – endpoints – ecotoxicity – health effects – environmental tests
3. spectrophotometry – electrophoresis – centrifugation – chromatography
4. $10\ \mu\text{m}$ – $100\ \text{nm}$ – $1000\ \text{pm}$ – $10^6\ \text{fm}$ – $10^9\ \text{am}$
5. water – consumer – primary producer – energy – decomposer
6. fish farms – oil spillage via pipelines – landfill sites – diffuse pollution
7. soil pollution – typhoid – amoebiasis – hookworm – ascariasis
8. pesticides – biodegradable – nonbiodegradable – domestic wastes – sewage
9. zone plate – nanotechnology – biosensors – virus – 10^{-15} second
10. biosphere – populations – organs – Earth – biomes

Q3- Answer as true (✓) or false (X)

[20] Marks

1. Noise pollution affects aquatic animals and songbirds nesting
2. Instrumentation is the art and science of measurement and control of analysis, production or manufacturing processes

3. Nanomachines and nanorobots moves with blood stream and guided with laser
4. Biomarkers can be used to confirm diagnosis of acute or chronic disease as cancer tumors
5. To obtain crude nuclei, the cells must be centrifuged at 700 g for 10 min
6. Toxicity includes the effect on a substructure of the organism and called ecotoxicity
7. Electrophoresis of positively charged particles is called anaphoresis
8. Picotechnology is a neologism parallel to the term nanotechnology as a hypothetical future level of technological manipulation of matter at the atomic level or on a scale of 10^{-18} m
9. Biomes are all possible ecosystems
10. Power stations are non-point source pollution

Q4- Choose the correct answer:

[10] Marks

1. is one of the sources of air pollution
 a) Volcanoes b) Forestry c) Shipping
2. Toxicity tests aim at identifying hazards to humans are generally referred to as
 a) end point b) safety c) ecotoxicity
3. In planar chromatography the stationary phase is
 a) glass b) a fine powder c) aluminum sheet
4. Survival and reproduction are biomarkers at the level of organization
 a) cells b) community c) individual
5. deals with subatomic level as duration pulses of electrons or photons to probe dynamic processes in matter with unprecedented time resolution
 a) Femtoscience b) Attoscience c) Nanoscience

..... Good Luck

Examiner

Dr. Waleed Khaled Elaidy

Mansoura University Faculty of Science Zoology Department Date: 1 /1 /2014 Time: 2 hr 1st semister		Academic year: 4th level Program: Chem. & Zoology. Subject: Biotic association and Animal beh. Z408 Total mark: 80 mark- Every quest. 20 marks.
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Answer all questions provided:

I. Write the scientific expression for the following statements:

1. The relationships that may arise between individuals of different Spp.
2. Both partners live separately, but they are meeting during feeding only.
3. Populations of both partners should actually co-exist. For considerable periods.
4. The host is necessary for the parasite to complete its life cycle.
- 5- Both partners live separate from each other. The host offers its parasite food only.
6. More than one host Spp. is necessary for the parasite to complete its life cycle.
7. A special case of predatism inside intraspecific B.As.
8. The animals which are active in night and they are called negatively phototactic.
9. Receptors which are scattered at the bases of internal organs.
10. Every behaviour action can be analyzed into behavioural nits.

II.A. Are the following statements true or false, rewrite the false statements:

1. Reflexes are every spontaneous response happen in a limited shape.
2. In benign parasitism the host is injured.
3. As for aquatic funa R.H. is not replaced by salinity.
4. Silk worm weaves accurate cocoon although it didn't see others to do this (acquired beh. Action).
5. Photoreceptors are found on cohlea as fine sensillae.

B. Complete the following sentences:

Mutualism are similar with commensalisms in,
 and They are differs in,,
 and

III. Compare between:

- A. Pure instinctive& acquired beh. Actions.
- B. Photoreceptors and chemoreceptors.

IV. Give an account on:

- A. Attributes which help the animal to perform their function successfully (2 only).
- B. Typical properties of predator& prey.

Best wishes.....

Dr. Hoda Salem



Mansoura University
Faculty of Science
Zoology Department
Subject: Zool. 401

Final Exam
Date /12/1/2013
Comp. Anat
Forth level Chemistry & Zoology
Time Allowed / Two hours

Answer the following **three** questions Full mark (60)

Q1- Choose the right answer of the following (15 Mark one for each)

a- Teeth of mammals are -----

Homophyodont only

Heterophyodont only

Heterophyodont and thecodont

homodont and bunodont

b- Cusps of goat are -----

Bunodont

selenodont

secodont

lophodont

c- The mid-dorsal bones of toad formed of -----

Squamosal only

frontal and parietal

nasal and parietal

nasal and frontal

d- Tusk of elephant is rootless -----

Canine

premolars

incisors

molaris

e- Nasal bone absent in the skull of -----

Toad

mammals

aves

turtle

f- Skull of different vertebrates classified according to-----

Number of fossa

size of fossa only

origin of fossa

presence or absence, number and position of fossa

g- Upper jaw formed from -----

Branchial arch

hyoid arch

platoquadrate

jugal

h- Mallus of the middle ear of mammals originated from -----

Mandibular arch hyomandibular articular quadrate

i- Splanchnocranium formed of -----

Upper jaw lower jaw 7 pairs of visceral arches 5pairs of branchial arches

j- Melanophores derived from

Dermis-----odontoblast-----neural crest cells----- epidermis

Q2- Write down on the following items (30)

a- Characters of hot-blooded skulls

b- Skeletal derivatives of integumentary system

c- Phylogeny of the vertebrae among vertebrate classes

Q4- Match between A and B columns (15)

A

B

Vomer belong to	Membranous
2-Main compartments of skull	Skeletal formation
3-Tabular belong to √	Paltine bones
4- Has no nerve or blood supply	Body cavity formation
5-lobulated occipital condyles present in	Mimic to habitate for protection
6- sphenoid bones are	All mammals only
7- organelles of irridophores	Monkey and rat
8- shizocoely is a method for	Neurocranium and splanchnocranium
9-Concleament is	Aves and amphibian
10-theophyodont present in	Mammals and crocodile
	Epidermis
	Cartilaginous
	Turtle
	Reflecting platelets
	Temporal bones

With best wishes

Prof.Dr. Zeinab M. El Gohary

Mansoura University Faculty of Science Chemistry Department Subject :Physical Chemistry Course(s): Spectroscopy and Surface chemistry (Chem 445)		First Term Date : Jan 2014 Time Allowed : 2 hours Full Marks : 60 Marks
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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 $-\text{CH}_2$ 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.

($h=6.62 \times 10^{-27} \text{ erg .S}$, $N_A = 6.02 \times 10^{23}$, atomic weights : $\text{H} = 1, \text{Br} = 80$). (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 0.901 g/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

- 4- The linear representation of Langmuir isotherm gives $S=0.001$ and $I=0.015 \text{ mol.g}^{-1}$, calculate the monolayer capacity and adsorption coefficient. (4marks)
- 5- From the linear representation of Freundlich isotherm, identify the slope 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 $I=0.025 \text{ mol.g}^{-1}$, calculate the adsorption enthalpy (vaporization enthalpy = 5.6 KJ/mol , $R = 8.314 \text{ J/mol.K}$) (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) $(\text{cm}^3/\text{mol}) (\text{erg}/\text{cm}^2)^{1/4}$ | b) $(\text{cm}^3/\text{g}) (\text{J}/\text{cm}^2)^{1/4}$ |
| c) $(\text{g}/\text{mol}) (\text{N}/\text{m})^{1/4}$ | 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 |
|--------------|---------------|---------------------|
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