الفرقة الرابعة - كيمياء وزواية - أجنة تجريبي (ع ٢٠١٤)

Mansoura UniversityEducationalyear: First Term
Faculty of ScienceYear: Fourth Year
Zoology DepartmentDate: 27/12/2014
Program: Chemistry & Zoology Time Allowed: 2hrs
Subject: Z 403Full Mark: 60 Marks
Course(s): Experimental EmbryologyFinal Exam

Attempt all the following questions

Q.I: Part 1)- MCQs: 10 Marks

(A) Please select the **single best answer** for each of the following questions:

1-What is the most common cause of infertility in men?
a.Hormone deficiency
b.Low sperm count
c.Blockages in the spermatic cord

2-Types of adult Stem cells are:
a-Umbilical cord stem cells
b-Placental stem cells
c-Germ stem cells

3-Human cloning is:
a.The creation of a genetically identical human being
b.Cloning produces cells that are genetically similar to each other (have the same DNA).
c.Cloning produces cells that are non genetically similar to each other

4-Requirements for cells to grow *in vitro*
a.Temperature at 37ºC
b. Lipids and Cholesterol
c.Amino acids (e.g. L-glutamine, non-essential amino acids)

5-The "common name" of the instrument that sterilizes tissue culture equipment?
a..Autoclave
b.Steam champer
c.Pressure cooker

6-Sertoli cells serve a number of functions during spermatogenesis
a.Secrete supporting testicular fluid
b.Secreteandrogen-binding protein
c. A & B

7-**Which type of cloning involves separating cells from the same embryo to produce multiple offspring?**
a.Natural cloning
b.Fusion cell cloning

c.Embryo transplants

8-What medical application could embryonic stem cells be used for?

a.Improve intelligence

b.Replace damaged tissue

c.Speed up digestion

9- One advantage of therapeutic cloning is that:

a.The donor cells will be rejected by the recipient's body

b.The donor cells will not be recognised as foreign by the recipient's body

c.The donor cells come directly from the recipient'sown body

10-Classification based on level of stem cell differentiation

a.Totipotent

b.Megapotent

c.Protopotent

PartII: True & Falsequestions 4 Marks

1- In vitro fertilization (IVF) is a simple, cost-effective procedure for infertile couples

True or False

2-Alzheimer's disease and can stem cells help?**True or False**

3-The ability ofadult stem cellto differentiate into multiple cell types is called plasticity**True or False**

4-Embryonic Stem Cells are never derived from eggs fertilized inside of a woman's body. **True or False**

Q.II:A)Fill in the spaces 5 Marks

1-Normal differentiation pathways of adult stem cells is—--------,------,----------

2-Unique properties of stem cells—----------,----------,----------

3-IVF&ET can be a suitable management for infertile couples suffering from the following problems: a.---------- b.----------

4-Importance of Cord blood stem cells are-------,----------

Q.II: B)Short Answer

(1)DiscussFour on the following:11 Marks

1-Compare betweenprimary culture&continous cell lines

2-How stem cell cure the following diseases, Parkinson disease &baldness?

3-Comparebetween Therapeutic Cloning& Reproductive Cloning

4-Applications of Animal Cloning

5-Three of Basic aseptic conditions

6-Distinguishing Features of Progenitor(Precursor Cells) and Stem Cells

Pof. Dr.AmouraAbou-El-Naga Good Luck

كيمياء نبات
كيمياء حيوان
كيمياء عضوية - كيمياء ضوئية كيمياء لإضافات (لـه ٤٣١)

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

First term
4th Year, Students.
Date: 30 / 12 / 2014.
Time Allowing: 2 Hours
Full Mark: 60

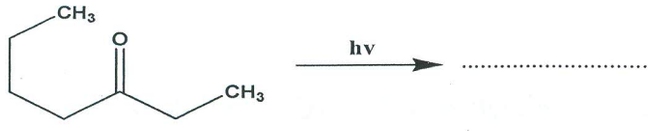
Photochemistry Part: Answer the following questions:

Question (1): Write brief account on the following and explain your answer by an example:

a) Norrish type I. (5 Marks)
b) Photoreaction of cyclic enones. (5 Marks)
c) Jablonski diagram. (5 Marks)

Question (2): Complete the following photochemical equations and suggest the suitable mechanisms. (15 Marks)

1)



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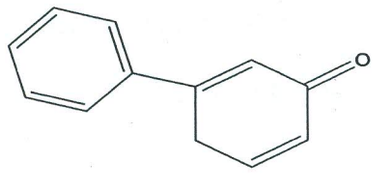

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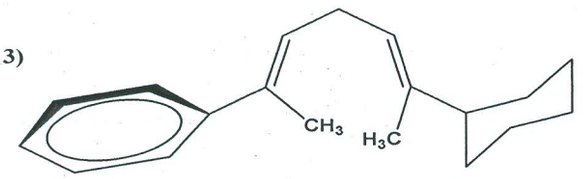

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Organic Spectroscopy Part: Answer the following questions:

Question (3): (15 Marks)

(A) A $C_9H_{10}O$ compound has strong infrared absorption at 1695 cm^{-1}. The ^1H NMR spectrum has five sets of signals: a triplet at δ = 1.3 (3H), a quartet at δ = 2.4 (2H), a doublet at δ = 7.0 (2H), a doublet at δ = 7.7 (2H) and a singlet at δ = 9.8 (1H) ppm. Suggest a structure for this compound.

(B) Using mass spectrometry, how can you distinguish between 1-propanol ($CH_3CH_2CH_2OH$) and 2-propanol ($CH_3CH(OH)CH_3$)?

(C) How many signals would the molecule ($CH_3OCH_2CH_2OH$) show in its ^1H-NMR spectrum?

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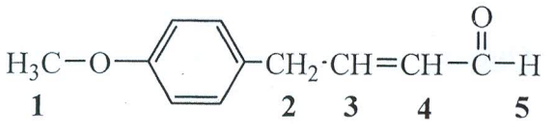
Question (4): (15 Marks)

(A) Choose the correct answer.

1- The coupling constant (J) for the splitting in the compound CH_2=C(Cl)CN is:
(a) 17 Hz (b) 12 Hz (c) 8 Hz (d) 2 Hz

2- Which of the following is true regarding the spectra of acetophenone ($PhCOCH_3$):
(a) In the ^{1}H NMR, the CH_3 group will resonate at approximately δ = 2.2 ppm
(b) In the ^{1}H NMR, the CH_3 group will resonate at approximately δ = 4.2 ppm
(c) The IR spectrum will display a significant absorption at about 2200 cm^{-1}
(d) In the mass spectrum, a significant peak will occur at m/e = 140

3- Which proton type (from H1 to H5) is the MOST deshielded?



(a) H1 (b) H2 (c) H3
(d) H4 (e) H5

4- The ^{1}H NMR spectrum of 1,2-dimethoxyethane (CH_3-O-CH_2CH_2-O-CH_3) will consist of:
(a) One singlet, δ 3.5, area 6, and two triplets, δ 3-4, area two each
(b) Two singlets in the region δ 3-4
(c) One singlet, δ 3.5, area 6, and one triplet, δ 4.0, area 4
(d) Two singlets in the region δ 6-7

5- What is the intensity ratio of the peaks of a quartet in ^{1}H NMR spectra?
(a) 1:1:1:1 (b) 1:2:2:1 (c) 1:3:3:1 (d) 1:4:4:1

6- When a high energy electron impacts molecule M in the ionization chamber, what type of species is initially produced?
(a) cation (b) radical (c) radical cation (d) radical anion

(B) The mass spectrum of ethyl benzene showed a strong peak at m/e 91. Explain?

GOOD LUCK
Prof. Dr. Mohamed Abou El-Dahab, Prof. Dr. Ehab Abdel-Latif and Dr. Eman Helmy

Mansoura University **Faculty of Science** **Chemistry Department** **Subject code: Chem. 415** **Course: Electro-analytical chemistry and spectroscopic methods of analysis**		**First semester examination** **4th level students** **Program: Chemistry/Zoology and Chemistry/Botany** **Date: 13/1/2015** **Time allowed: 2 hours** **Full mark: 80 marks**

Answer the following questions: (الأسئله في صفحتين)

Section A: (Spectroscopic methods of analysis) (40 marks)

Question 1: (20 marks)

a. **Define each of the following: (10 marks)**

1. Spectroscopy.
2. Frequency.
3. Atomic absorption spectrum.
4. Chromophore.
5. Turbidimetry.

b. **Compare between:** obedience and deviations of Beer's law. **(6 marks)**

c. **Calculate** the molar absorptivity coefficient of $K_2Cr_2O_7$ at 455 nm, given that: **36.5 mg** was dissolved in **500 mL** and exhibits **12%** transmittance at 455 nm in a **2-cm** cell. (K=39, Cr=52, O=16). **(4 marks)**

Question 2: (20 marks)

a. **Put true (√) or false (×) and correct the wrong one: (10 marks)**

1. Saturated hydrocarbons can be analyzed using UV radiations.
2. In phototube detector, electrons move from anode to cathode.
3. The sample holder which used in UV analysis is made of crystalline NaCl.
4. Deformation vibrations involve change in bond length.
5. The source of colour in V_2O_5 is due to charge transfer spectra.

b. **Sketch the diagram which represents:** the atomic transition. **(4 marks)**

c. **Calculate** (ν, λ and E) for (O-H) bond knowing that: ($k=7.7\times10^5$ dyne/cm, $h=6.63\times10^{-34}$ J/s, $c=3\times10^{10}$ cm/sec, O=16, H=1). **(6 marks)**

Please turn the page →

Section B: (Electro-analytical chemistry) (40 marks)

Question 3: (20 marks)

a. **Complete each of the following sentences: (5 marks)**

1. ISE's not affected by ..... or.....
2. In Gran's Plot, ... is plotted against.....
3. As^{3+} can be determined by titration with I_3^- at pH.....in presence of ..... solution.
4. In potentiostatic coulometry, ... and .....will decrease with time.
5. Ilkovic equation used for ..... analysis, while $E_{1/2}$ used for ..... analysis.

b. **Put true (√) or false (×) and correct the wrong one: (5 marks)**

1. In static methods, no current passes in the electrochemical cell as in potentiometry.
2. Electrodes of **4th** kind can follow the reaction mechanism for any redox reaction.
3. Alkaline error appears in glass electrodes when the measured pH is lower than the true pH.
4. High stirring rate in controlled-potential coulometry will help to minimize electrolysis time.
5. The current maxima may be removed by addition of surfactant like (Triton X-100).

c. **Sketch the diagram which represents**: the cell used for electro-deposition process. **(4 marks)**

d. A cyclic voltammetric peak current of (**10.5 µA**) is observed for (**0.6 mol/L**) solution of vitamin C at glassy carbon electrode of (**3.2 mm^2**) area with potential scan rate of (**0.25 v/sec**). **Calculate:**

1. i_p if potential scan rate is (**1.5 v/sec**) and concentration is (**0.9 mol/L**). **(3 marks)**
2. E^o_{mid} and **number of electrons**, if (E_{pa}= **0.5566 v** and E_{pc}= **0.5271 v**). **(3 marks)**

Question 4: (20 marks)

a. **Define each of the following: (6 marks)**

1. Potentiostat.
2. Coulometry.
3. Stoke-Einstein equation.

b. **What are the coulometric titration terms analogous to the conventional volumetric titration terms given below: (4 marks)**

1. Concentration of titrant.
2. Volume of titrant.

c. **Comment on the following: (6 marks)**

1. **Co** and **Fe** cannot be used as electrodes of **1st** kind.
2. Bubbling N_2 into the solution for several minutes before polarographic measurements.

d. A **10 mg** sample of a purified organic base is dissolved in **150 mL** of alcohol-water solvent, and H_3O^+ is generated externally at **100 mA** and delivered to the solution. If **193 sec** are required to reach the methyl orange end point, **calculate the molecular weight** of the organic base knowing that the number of electrons involved in the reaction = **3**. **(4 marks)**

Good luck: Dr. Yasmeen Gaber and Dr. Hany Moustafa

ع كيمياء/حيوان - تلوث بيئي وتحاليل بيولوجية ع ٤٠٥

University of Mansoura
Faculty of Science
Department of Zoology
Educational year: Fourth Level
Program: Chemistry/Zoology

Course: Environmental Pollution and Biological Analysis (Z 405) (Optional)
Date: 10 January 2015
Time: 2 hours
Full Mark: 80 Marks

Q1- Discuss with details the following topics **[30] Marks**

1. Femtochemistry and the environmental and medical applications of femtosecond
2. Types of pollutants
3. Factors affecting toxicity

Q2- Answer as true (✓) or false (X) **[20] Marks**

1. Many toxicity tests examine specific types of adverse effects, known as "endpoints"
2. Biomes are the largest of all possible ecosystems
3. Nanomachines and nanorobots moves with blood stream and guided with laser
4. 1 mg / kg = 1 µg / ml = 1 ppm
5. Ecology includes all organization levels from organism to biosphere
6. 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
7. Separating funnel is used in liquid-liquid extraction technique
8. Electrophoresis of negatively charged particles is called cataphoresis
9. Procedure of bioanalysis is sample preparation, instrumentation and software
10. A power station is a non-point source pollution

Q3- Choose the correct answer: **[20] Marks**

1. ..... is a tool may detect disease in a very small amount of cells or tissue

   a) Nano-engineering b) Nano-device c) Nano-science

2. Toxicity includes the effect on substructures of the organism and called .....

   a) ecotoxicity b) organotoxicity c) cytotoxicity

3. ..... is a graph showing the detector response as a function of elution time

   a) Cardiogram b) Chromatogram c) Cephalogram

4. A hazy layer called ..... may hang over industrial cities indicates to air pollution

   a) smog b) fog c) smut

5. ..... confirm diagnosis of acute or chronic disease as cancer tumors

   a) Biomarkers b) Bioindicators c) Bioassays

6. ..... is a technique of instrumentation in bioanalysis

   a) Protein precipitation b) Centrifugation c) Spectrophotometry

7. Survival and reproduction are biomarkers at the ..... organization level

   a) cells b) individual c) community

8. To obtain crude nuclei, the cells must be centrifuged at .....

   a) 700 g for 10 min b) 1000 g for 10 min c) 700 g for 15 min

9. In the thin layer chromatography, the stationary phase is .....

   a) glass b) a paper sheet c) a fine powder

10. ..... 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

Q4- Choose the alien word(s), answering <u>five</u> only **[10] Marks**

1. fish farms – oil spillage via pipelines – landfill sites – diffuse pollution
2. spectrophotometry – electrophoresis – centrifugation – chromatography
3. 10 μm – 100 nm – 1000 pm -10^6 fm – 10^9 am
4. soil pollution – typhoid – amoebiasis – hookworm – ascariasis
5. fitness – biomarker – biodiversity – bioassay – animal density
6. water – consumer – primary producer – energy – decomposer

,,, BEST WISHES ,,,

Examiner: Dr. Waleed Khaled Elaidy

ع كيمياء وزوولوجي - علاقات بيولوجية وسلوك Z408

Mansoura University
Faculty of Science
Zoology Department
Full Mark: 80 mark
Time: 2 hr.

Academic year: 4th level
Program: Chemistry&Zoology
Subject: Biotic association & behavior (Z408)
Date: 10/1/2015

Answer All questions provided:

I- Write the scientific expression for the following statements:

1- The relationships that may arise between individuals of the same spp.

2- The animals which are active in day and they are called positively phototactic.

3- An aggregation of structurally similar indivi duals through reproduction along suceessive generations

4- Individuals of the same sp. Have similar biotic requirements.

5- The parasite lives inside the cavities of the host.

6- A predator can usually lives on 2 or more prey spp.

7- Every beh. Action can be analyzed into behavioral units.

8- Receptors which are feel the changes on to internal organs of the body.

9- Organs that transfer the receptive organ reaction.

10- Receptors that are found in the retina.

II-A- Complete the following sentences:

1- A picture case of benigen endoparasitism is ..... The association between the foetus and ..... is more ....., as both partners are not only ..... But also the foetus begins as ..... of the .....

2- The aptitude to practice any behaviour carries on ..... It is responsible for the presence of ..... rises in ..... immediately after ....., then it ..... gradually with the common ....., ... in behavioural action.

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B- Are the following statements true or false, rewrite the false one.

1- Cooperation is always a harmful interspecific B.As.

2- As for terrestrial funa the R.H. is replaced by salinity.

3- Receptors release the suitable sign and guide it to the suitable organ.

4- The worker of honey bee at the beginning of her life, put royal jelly in the hexagonal cell.

5- The host is necessary to parasite to complete it's life cycle in obligate parasitism.

III- Discuss the following:

1- Insentictive and acquired behaviour.

2- Classification of paratism according to Necessity of host.

3- Confined mutualism.

4- Attribules of behaviour action (2 only).

Best wishes

Dr. Hoda Salem