


312 - كيمياء صورية
كيمياء نبات
ميكروبيولوجيا

<p>Mansoura University Faculty of Science Chemistry Department Subject code: Chem. 314 Course: Volumetric analysis, Gravimetric analysis and Chromatography</p>		<p>First semester examination 3rd level students Program: Chemistry/Zoology, Chemistry/Botany and Microbiology Date: 12/1/2015 Time allowed: 2 hours Full mark: 60 marks</p>
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Answer the following questions: (الأسئلة في صفتين)

Section A: (Volumetric analysis and Gravimetric analysis) (30 marks)

Question 1: Choose the correct answers only: (20 marks)

1. Determine the number of moles of $Ba(OH)_2$ needed to neutralize 2 moles of HCl .
a-1 b-2 c-3 d-4
2. 15.71% (w/w) H_2SO_4 solution its density 1.2 g/mL, the normality of this solution is:
a-3.8 b-7.0 c-1.7 (H = 1, S = 32, O = 16)
3. 128.1 g of $NaCl$ dissolved in 700 mL of water, the molarity of this solution is:
a-5.13 b-3.13 c-0.13
4. The chemical formula of the compound formed at the end point in Mohr's method is:
a- Ag_2CrO_4 b- $Ag_2Cr_2O_7$ c- $AgNO_3$ d- $AgCl$
5. The number of moles for 200 mL of 2N H_2SO_4 is:
a-1.00 b-0.2 c-2 d-0.4
6. The indicator used in complexometric titrations is:
a- bromocresol green b-litmus
c- metallochromic d-methyl orange
7. pOH of 0.2M $Li(OH)$ is:
a-(-log 0.1) b-(-log 0.2) c-(-log 0.4) d-(-log 0.8)
8. If 200 mL of 0.1M HCl is mixed with 50 mL of 0.1M $AgNO_3$, pCl is:
a-1.2 b-4.00 c-0.6 d-0.2
9. Mohr's titration shouldn't be carried out at pHs:
a-3 b-7 c-12
10. The unit of strength is:
a-mol/L b-mol/kg c-unitless d-mg/mL

Question 2: Answer the following:

- I. What are the requirements should be met in order that a gravimetric method to be successful.
(3 marks)
- II. In titration of 50 ml 0.1M CH_3COOH with 0.05M $NaOH$, calculate pH of solution at the following additions : a) 0.0 ml b) 5 ml c) 100 ml d) 120 ml. ($HC_2H_3O_2, K_a = 1.8 \times 10^{-5}$). (3 marks)
- III. Discuss two methods only used for detection of the end point in precipitation titrations. (4 marks)

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Section B: (Chromatography) (30 marks)

Question 3: (15 marks)

a. Complete the following sentences: (4 marks)

1. In partition chromatography, separation depends on..... of the analyte between.....
2. For non-polar supports like charcoal, the weak eluent is and the strong eluent is.....
3. Swelling and blocking in polystyrene resin can be avoided using.....which act as.....
4. Calibration curve in SEC used to determine..... by knowing.....

b. Put true (✓) or false (×) and correct the wrong one: (4 marks)

1. RPLC used in urine analysis while NPLC used in purification of organic compounds.
2. Polycondensation of aromatic amines with formaldehyde results in anionic exchangers.
3. In SEC, large particles of high molecular weight require small time for separation.
4. Affinity chromatography use immobilized biological molecule as stationary phase.

c. Sketch the diagram which represents: HPLC instrument. (4 marks)

d. Define each of the following: (3 marks)

1. Chromatography.
2. Degassing.
3. Capacity of resin.

Question 4: (15 marks)

a. Compare between each pair of the following: (6 marks) (المقارنه توضع في شكل جدول)

1. FID and TCD (type of signal, selectivity, D_L).
2. Bio-specific elution and Non-specific elution (speed of elution, shape of solute peak, uses).

b. Comment on the following: (4 marks)

1. O_2 cannot be used as a carrier gas in GC instrument.
2. SEC cannot be used for the separation of isomers.

c. If 50 g of a pollutant with concentration = 1.6 g/L and molecular weight = 80 g/mol, was extracted with 120 cm³ of organic solvent. The remaining concentration was found to be 2×10^{-3} mol/L. Calculate:

1. Distribution ratio (D_C). (3 marks)
 2. Total amount extracted (%E) after 4 times of extraction. (2 marks)
-



Level 3, Programs: Biophysics, Microbiology, Chemistry & Botany, Chemistry & Zoology and Environment Science.

Answer The Following Questions

Question 1:

(a) Patients were treated for insomnia by some drug. Recorded below are the hours of sleep the patients got during the second night after treatment began:

(i) Complete the following table: [9 Marks]

True class interval	Midpoint	Frequency	Relative frequency	Cumulative frequency
2.55 – 4.55	3.55	13
4.55 – 6.55	...	17	0.34	...
... –	43
... –	1	0.02	...
... –	0.08	48
... –	0
... –

(ii) What percentage of patients got 6.55 or less hours of sleep during the second night after treatment? [4 Marks]

(iii) Graph a cumulative frequency distribution. [4 Marks]

(b) Let $P(A) = 0.4$ and $P(A \cup B) = 0.7$. Find $P(B)$ if: [9 Marks]

- (i) A and B are independent. (ii) A and B are mutually exclusive. (iii) A subset of B.

Question 2:

(a) Suppose we measure the duration of labor (in hours) for a sample of pregnant woman and obtain:

Duration of labor	0.5 – 2.5	2.5 – 4.5	4.5 – 6.5	6.5 – 8.5	8.5 – 10.5	10.5 – 12.5	12.5 – 14.5
Frequency	10	15	30	20	10	8	7

Find approximate values for: [18 Marks]

- (i) The sample mean, mode and median. (ii) The variance and coefficient of variation.
- (b) The probability that a patient recovers from a rare blood disease is 0.45. If 20 people are known to have contracted this disease. [9 Marks]
- (i) What is the probability that at least 3 survive.
- (ii) What is the probability that exactly 8 survive.
- (iii) What is the expected number and variance of the patients that be survived.

Question 3:

(a) Suppose that in the population of healthy females, the red blood count (divided by $10^{12}/l$) has an normal distribution with a mean of 4.8 and a standard deviation of 0.3. What is probability that the red blood count is: [12 Marks]

- (i) greater than 5, (ii) less than 3.8, (iii) between 4.2 and 5.4
- (b) Certain tubes manufactured by a company have a mean lifetime of 900 hr., and standard deviation of 50 hr. Find the probability that a random sample of 64 tubes taken from the group will have a mean lifetime between 895 and 910 hrs. [9 Marks]
- (c) The probability that a student, selected at random from a certain College, will pass a certain economics course is $4/5$ and will pass both economics and statistics courses is $1/2$ What is the probability that he will pass statistics if it is known that he had passed economics? [6 Marks]

Hint: $\Phi(0.67) = 0.7486$, $\Phi(0.8) = 0.7882$, $\Phi(1.6) = 0.9452$, $\Phi(2) = 0.9773$, $\Phi(3.33) = 0.9994$.

Good Luck

Examiners: Dr. A. Mustafa, Dr. F. Sheha and M. Abdel Rahman.

ر.د. محمد حسن - د. منال رمضان

Mansoura University
Faculty of Science
Zoology Department



First Term Exam, Jan. 2015

Education year: Third level
Time: 2 hours
Date: 5/ 1/ 2015

Program: Chemistry/ Zoology
Subject: Zoology
Course: Embryology
Total Mark: 60

Answer the following questions:

Q1) Give an account of the modification which occur in the development of respiratory organ of frog during larval history. (15 marks)

Q2) A- Write short notes by using labeled diagrams on:

- 1- Development of central nervous system of Frog. (7 marks)
- 2- Compare between the presumptive maps of Amphioxus and Frog. (8marks)

Q2) B- Write briefly on the general characters of chick embryo 33 hours, Adding labeled diagram. (8marks)

Q3) A- Choose the correct answer: (7marks)

- 1- The maximum elongation of the primitive streak occurs at of incubation.
a- 13 hours b- 16 hours c- 20 hours
- 2- The first cells migrate deeply through Hensen's node are destined to become the
a- endoderm b- endoderm of the fore guts c- mesoderm
- 3- While the streak starts to regress, the ingresses cells at the anterior end of Hensen's node give rise to
a- prechordal mesoderm b- intermediate mesoderm c- lateral mesoderm
- 4- Each blastomere of an 8-cell human embryo is said to be.....
a- totipotent b- pluripotent c- multipotent
- 5- The inner cell mass (ICM) of mammalian will give rise to
a- embryo proper b- embryo, amnion, yolk sac & allantois c- chorion
- 6- ICM supports theby secreting Fgf4 protein that cause its cells to divide.
a- amnion b- yolk sac c- trophoblast
- 7- The compact cells of human embryo are stabilized by ...between the outside cells.
a- gap junction b- tight junction c- both of them

Q3)B- Give the reason for the following phenomenon: (5marks)

- 1- Closure of chick embryo 20 hours.
- 2- Mesencephalon is located at the anterior part of chick embryo 48 hours.
- 3- The anterior part of chick 48 hours lies on its left side on the yolk.

Q3)C-Compare between gastrulation of Birds and Mammals. (10marks)

With our best wishes.....Prof.Dr. Mohamad Hassan, Dr. Manal Ramadan

(176) كاتر سبجورجيا - عليمات
 1760

Mansoura University
 Faculty of Science
 Chemistry Department
 Subject: Chemistry

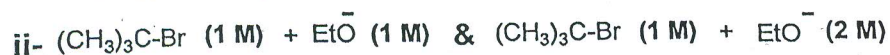


First Term
 Time Allowed: 2 Hours
 Date: Jan. 2015
 Full Marks : 80

Course(s): Chem.336 Physical Organic Chemistry for 3rd Level
 Biochemistry, Chem. Zool., Chem. Bot., students

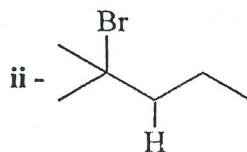
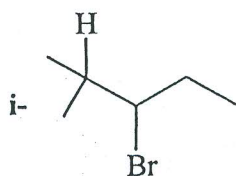
Answer All Questions

Q1: a) Which reaction of each pair of the following would you expect to be more rapid. **Explain** (12 Marks)

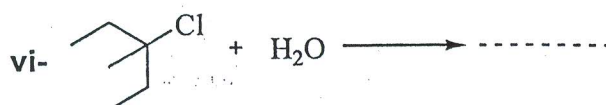
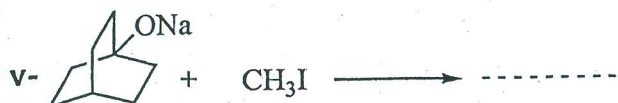
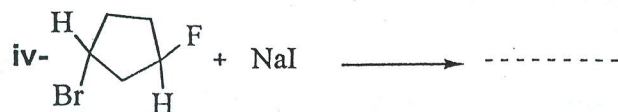
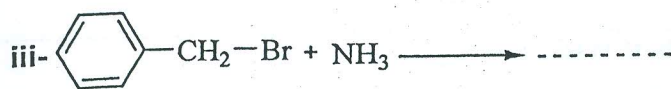
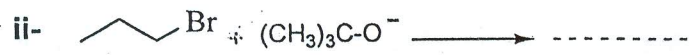
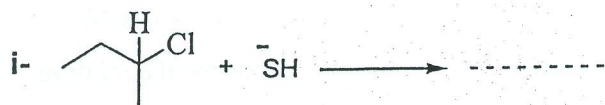


b- When toluene was treated with 1-chloro-2-methylpropane in the presence of anhydrous AlCl_3 , the product was 1-*t*-butyl-4-methylbenzene. **Explain** the formation of such product. (4 Marks)

c) Which compound in the following pair undergoes E^2 reaction more rapidly when treated with CH_3ONa ? **Explain your answer** (4 Marks)



Q2: A) Complete the following equations showing only the **major organic product** and **discuss** which reaction mechanisms (SN^1 , SN^2 , E^1 , and E^2) is the most likely. (18 Marks)

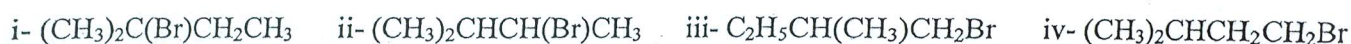


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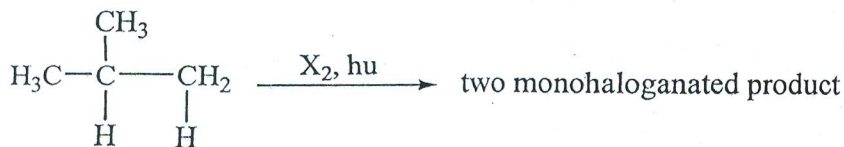
b) Sketch potential energy diagrams for the following reactions. Label the heat of reaction (ΔH) and activation energy (Eact.) in each case. (6 Marks)



C) Which of the following alkyl substrates will rapidly undergo E^1 reaction with strong base to give mixture of two isomeric alkenes? (6 Marks)



Q3: a-For the following reaction: (12 Marks)

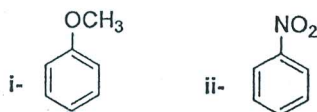


i- What are the monohalogenated product(s) indicating the yield percentage for each one when $\text{X}_2 = \text{Cl}_2$ & Br_2

ii- Explain why I_2 less reactive than Br_2 knowing that DH° Kcal/mole values are shown in the following table:

Halogen	DH° value	H-X	DH° value	$3^\circ \text{C}-$	DH° value
I_2	36	HI	71	$3^\circ \text{C}-\text{H}$	91
Br_2	46	HBr	87.5	$3^\circ \text{C}-\text{X}$	X = I, 49.5 & X = Br, 63

b- Predict the major ring mononitrated product of the following aromatic compounds indicate your answer with resonance structures in each case: (10 Marks)



c- The relative rates of ethanolyysis of the following alkyl halides are as follows: (8 Marks)

$\text{CH}_3\text{CH}_2\text{Br}$	$\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$	$(\text{CH}_3)_2\text{CHCH}_2\text{Br}$	$(\text{CH}_3)_3\text{C}-\text{CH}_2\text{Br}$
1	0.28	0.03	42×10^{-6}

Are these reactions likely to be SN^1 or SN^2 . Explain your answer providing an explanation for the relative reactivities that are observed

With our Best Wishes

Examiners: Dr. Ebrahim Abdel-Galil

Dr. Soha M. Abdelmageed

Dr. Ahmed El-Mekabaty

[4] Choose the correct answer to each of the following questions:

(20 marks)

- 1) Which one of the following can act as a tridentate ligand (occupies 3 coordination positions in a complex ion)?
a) $(\text{CH}_3)_2\text{NH}$ b) $\text{CH}_3\text{HNCH}_2\text{CH}_2\text{NHCH}_3$ c) NH_3 d) $\text{CH}_3\text{HNCH}_2\text{CH}_2\text{NHCH}_2\text{CH}_2\text{NHCH}_3$
- 2) The number of unpaired electrons in the low-spin complex, $[\text{Co}(\text{CN})_6]^{3-}$ is
a) 0 b) 1 c) 2 d) 4
- 3) Which one of the following compounds is likely to be colorless?
a) $[\text{Cu}(\text{OH}_2)_6]^{2+}$ b) $[\text{Zn}(\text{OH}_2)_6]^{2+}$ c) $[\text{Fe}(\text{OH}_2)_6]^{2+}$ d) $[\text{Cr}(\text{OH}_2)_6]^{2+}$
- 4) d-Block elements among the following contain partially filled d – subshell and does not show variable oxidation states.
a) Zn b) Cd c) La d) Hg
- 5) d-Block elements have the maximum number of unpaired electrons.
a) Fe^{2+} b) Fe^{3+} c) Co^{3+} d) Co^{2+}
- 6) Ethylenediaminetetraacetate ion (EDTA^{4-}) is commonly referred to as a:
a) Hexadentate b) Monodentate c) Bidentate d) Tridentate
- 7) In the complex $[\text{Fe}(\text{H}_2\text{O})_5(\text{NO}_2)]\text{SO}_4$, the oxidation state of iron is:
a) +1 b) 0 c) +2 d) +3
- 8) Which of the following will show maximum magnetic moment?
a) $3d^9$ b) $3d^5$ c) $3d^7$ d) $3d^8$
- 9) The most widely used commercial chemical as a paint pigment is:
a) SiO_2 b) MgO c) TiO_2 d) Al_2O_3
- 10) The aqueous solution of which salt is colored:
a) $\text{Co}(\text{NO}_3)_2$ b) $\text{Zn}(\text{NO}_3)_2$ c) CrCl_3 d) Both a and c
- 11) The lanthanide contraction is related to:
a) Density b) Ionic radii c) Color d) Valence electrons
- 12) Which among the following show variable oxidation states?
a) Mn b) Fe c) Co d) All of these.
- 13) Which among the following is a set of transition elements?
a) Cu, Au, Ni b) Sn, Bi, Na c) Sb, Pb, Al d) All of these.
- 14) The surrounding ions or molecules in complexes of transitional elements are called as
a) Chelates b) Ligand c) Matalloids d) None of these
- 15) Paramagnetism is exhibited by d-block elements due to the presence of
a) Unpaired electron b) Paired electron c) Incomplete f-orbitals d) None of these
- 16) Manganese is in +4 oxidation state in
a) MnO b) MnO_3 c) MnO_2 d) None of these
- 17) Which of the following scientists is associated with complex compounds?
a) Werner b) Pauling c) Lweis d) Wilkinson
- 18) In Lithium tetrahydro aluminate, the ligand is:
a) H b) H^+ c) H^- d) None of these.
- 19) IUPAC name for $[\text{Co}(\text{NH}_3)_5(\text{ONO})]\text{SO}_4$ is:
a) Pentaaminenitrocobalt(II) sulphate b) Pentaaminenitrocobalt(III) sulphate
c) Pentaaminenitritocobalt(II) sulphate d) Pentaaminenitritocobalt(III) sulphate
- 20) With decrease in size of cation:
a) Complex forming tendency decreases. b) Complex forming tendency increases.
c) Complex forming tendency does not change. d) None of these.

السؤال الثالث - كيمياء هeterocyclic
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Mansoura University
 Faculty of Science
 Chemistry Department
 Subject: Chemistry
 Course(s): Org.Chem.337

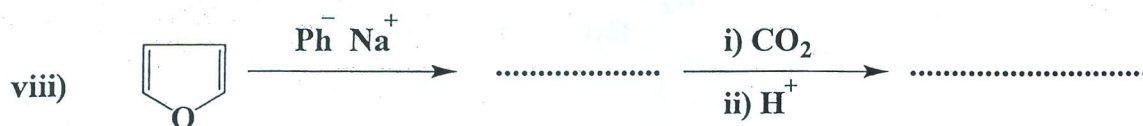
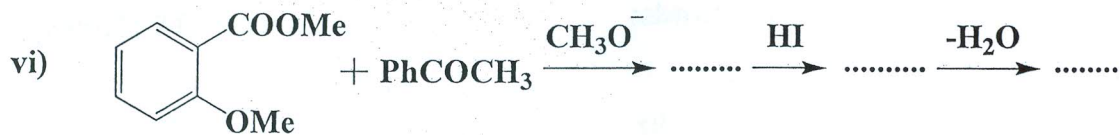
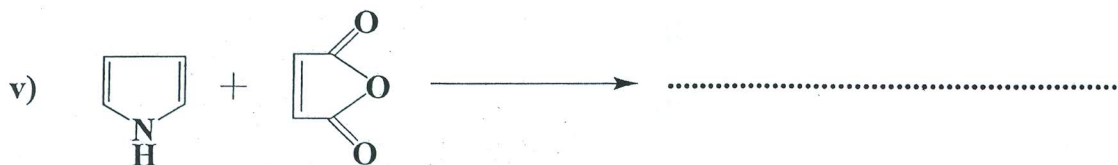
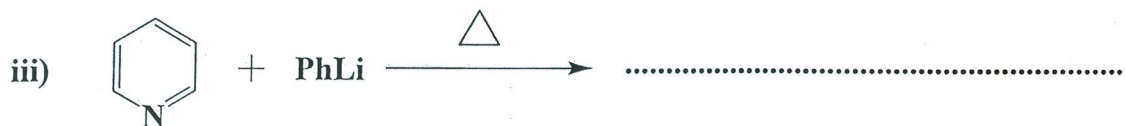
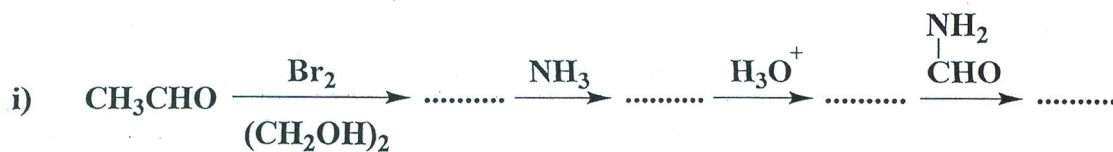


1st Term
 3rd Level Students
 Date: 25 / 12 / 2014
 Time Allowed: 2 Hours
 Full Mark: 80 Marks

Answer All Questions

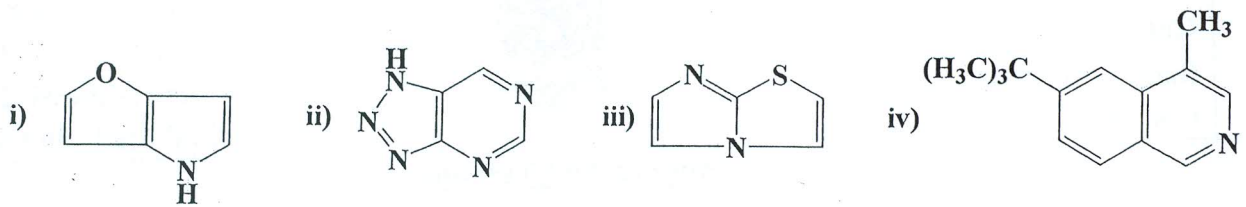
1- Predict the heterocyclic product(s):

[27 Marks]



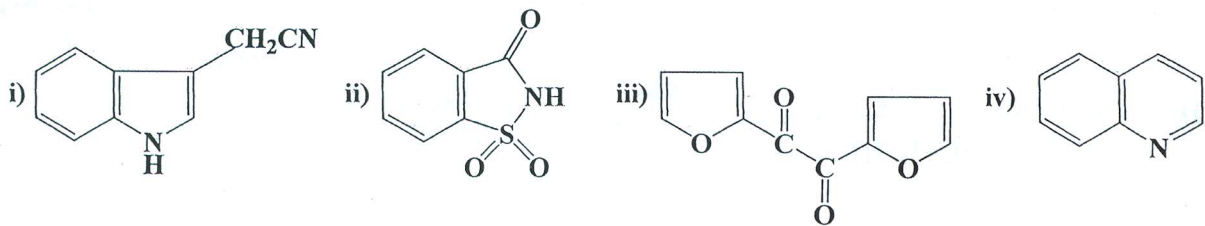
2- a) Give acceptable name of each of these heterocycles:

[8 Marks]



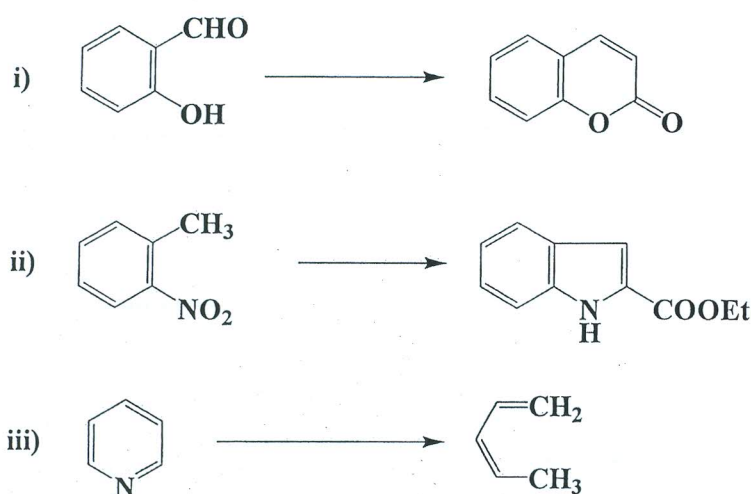
b) Diagram one synthesis of each of the molecules below:

[18 Marks]



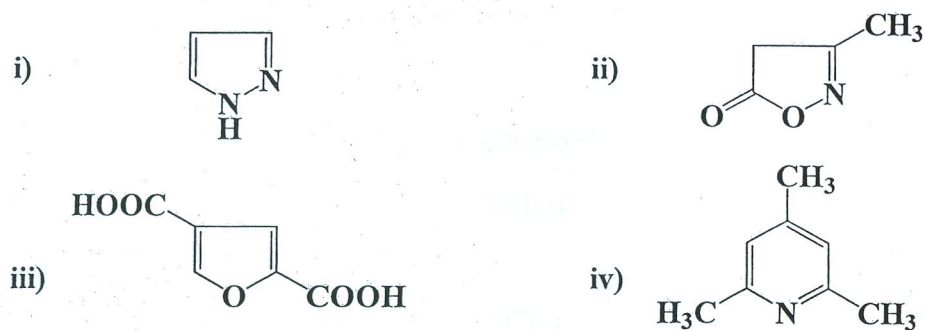
3- a) Diagram these conversions:

[9 Marks]



b) Design the synthesis of these compounds:

[18 Marks]



Best Wishes and Good luck

Examiners: Prof. Dr. Ez Kandil, Prof. Dr. Evelin Boshra,
A.Prof. Dr. Eman Keshk

11. 2 pages - subject

Mansoura University
Faculty of Science
Zoology Department
Subject: Toxicology Z310



First Term
January, 2015
Date: 22/12/2014
Time: 2 hours

Final examination for 3rd level students, program Chemistry & Zoology.

Answer all the following questions

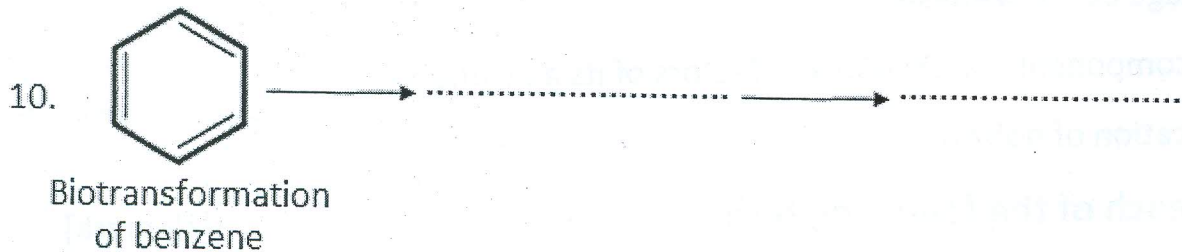
First question:

[30 mark]

(A) Fill the spaces:

[15 mark]

1. Transport is not saturable at high concentration gradients is a characteristic of.....
2. An adverse effect that is manifested within a relatively short time of exposure is known as.....
3. Zone 3 in the liver is located around where blood
4. Factors interfere with intestinal absorption of a given chemical are.....
5. Types of phase I metabolism reactions are.....
6. The amount of a substance required to reach the target cells or organ, and to produce an expected effect is called.....
7. is characterized by a marked change from a highly differentiated cell type to one that is less differentiated or more embryonic in nature.
8. Intoxication with carbon monoxide leads to hypoxia because.....
9. Long-term exposure to small doses of some drugs can produce severe toxicity because.....



5) Put (✓) or (X), and correct the false sentences:

[15 mark]

1. A compound contains functional group must be exposed to phase I reactions.
2. Steatosis is characterized by accumulation of triglyceride in the liver that leads to produce fatty liver.
3. Bioavailability in case of absorption of the drug or toxin through the biological membranes is approximately equal 100%.
4. Pinocytosis is a specific process by which the cell engulfs certain substances.
5. A highly-toxic substance, which is poorly absorbed, may be no more of a hazard than a substance of low toxicity that is highly absorbed.
6. Cholestasis is a condition characterized by replacement of liver tissue by fibrosis, scar tissue, and regenerative nodules.
7. Primary carcinogen is a chemical that is reactive enough to elicit carcinogenic effects in the parent, unmetabolized form.
8. Absorption of the acidic drugs in the gastrointestinal tract requires an alkaline medium to be in an ionized form.
9. The quantitation of the time course of movement of toxicants through the body is known as toxicokinetic.
10. Phase II enzymes are, for the most part, located in the cytoplasm (water portion) of cells.

Second question:

[30 mark]

(A) Write short notes on each of the following subjects:

[15 mark]

1. Multistage carcinogenesis.
2. Major components of CYP450 and factors of its activation.
3. Classification of poisons.

(B) Identify each of the following terms:

[15 mark]

1. Tolerance 2. Metastasis 3. Necrosis 4. Xenobiotics 5. Hazard

Third question:

[20 mark]

A-Complete the following:

[10 mark]

1. Oxidative stress markers such as.....while antioxidants include.....
2. Toxicity classified intoaccording to nature but according to origin classified into.....
3. Phthalate induces.....toxicity and.....can used as a curative agent.
4. CCl₄ as a toxic agent causes..... toxicity
5. Testicular markers for toxicity include.....
6. Factors affecting toxicity such as.....
7. Liver markers for toxicity as.....
8. Garlic oil protects.....from toxicity induced by.....
9. Route of toxins administration includes.....

B-Identify each of the following terms:

[4 mark]

1. Toxicity
2. Teratogenesis
3. Toxicologist
4. Toxins

C- Mention the types of toxicity according to organ.

[3 mark]

D- Select one design of the experimental toxicity that you provided with it, and briefly mention these items.

[3 mark]

1. title
2. toxic materials
3. protective agent
4. experimental animal
5. organ
6. Indicative parameters
7. conclusion
8. your comments

مع تمنياتنا لكم بالتوفيق

Prof. Dr./ Hanaa Ali Hassan

Dr./ Faried Abdel-Kader

مكتبة جامعة المنصورة
البيوتات البيئية والبيئية
2014

Mansoura University
Faculty of Science
Zoology Department
Time: 2 hours
Full mark: 80 marks



Academic year: 3rd level
Program:
Chemistry & Zoology
Subject: Desert
ecology & Egyptian fauna
(Z309)
Date: 22/12/2014

Answer all the following questions:

Q1-A-Choose the correct answer:(10 marks)

- 1-Weather is considered as ----- of the environment.
a) abiotic component b) biotic component c) a&b
- 2-The partly upright pyramid of number can be seen in the-----ecosystems .
a) grassland b) aquatic c) forest
- 3-Sea anemone, shrimps and echinoderms are considered as-----
a) macrofauna b) infauna c) epifauna
- 4-In living organisms phosphorus is found as-----ions.
a) hydrogen phosphate b) dihydrogen phosphate c) phosphate
- 5-Holozoans comprise the following **except**-----
a) autotrophs b) carnivores c) herbivores
- 6-A descriptive study of the interaction between living organisms and their environment is known as-----
a) ecosystem b) ecology c) community
- 7- Which of the following organisms fix nitrogen in ecosystems?
a) fungi b) cyanobacteria c) phytoplanktons
- 8-Desert animals gained direct heat from direct contact with the ground through a process known as -----
a) conduction b) conjugation c) convection
- 9-The abiotic environmental component----- is considered as a physical factor.
a) minerals b) humidity c) alkalinity
- 10-pH of water may affect-----of living organisms.
a) population growth b) occurrence c) a&b

B-Replace the following descriptions with the suitable expression:
(10 marks)

- 1-Individuals of different species inhabiting the same environment. -----

- 2-A type of adaptation characterize the reptile *Chameleon*. -----
- 3- The reptiles and amphibians of a particular region, habitat, or geological period. -----
- 4-Heat brought by wind and air movements which can raise desert temperature. -----
- 5-The change in a population by decrease or increase. -----

Q2-A-Complete the followings: (15 marks)

- 1-The Nile catfish showed-----dispersion in river while colonial birds showed -----dispersion.
- 2-For determining food chain and food web we can use-----and -----
- 3-Heterozoic nutrition can be divided into ----- ,-----and-----nutrition.
- 4-Mammalian gut has constant temperature but variable----- ,-----and -----
- 5-Ecological pyramids are graphical representation which depicts----- ,-----and-----at each trophic level.
- 6-Giraffes and buffaloes both are herbivores but we can classify giraffes as----- while buffaloes as -----

B- Mention the equation for calculating the rate of population growth with defining each item in the equation. (5 marks)

Q3-A-Determine the true or false sentence: (10 marks)

- 1-The sequence of levels of organization is;individuals-population-community-ecosystem- biosphere. ()
- 2-In gut communities; symbionts usually found in hind gut however parasites in fore gut. ()
- 3-Carrying capacity is inversely proportional to the size of the organism. ()
- 4-Nitrogen is the fundamental component of dead organic matters and living tissues. ()
- 5-Desert animals has high metabolic rate. ()

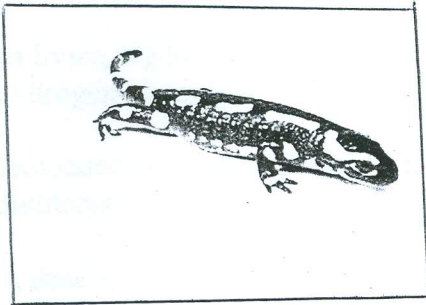
B-Compare between adaptation and acclimation. (10 marks)

Q4-A-Show with labelled diagram the nitrogen cycle in terrestrial environments. (10 marks)

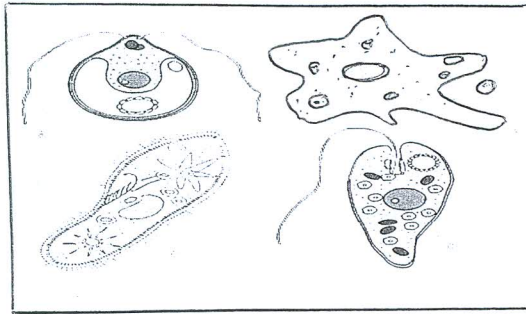
B-Mention what is each picture of the followings referring to. (10 marks)



-1-



-2-



-3-



-4-



-5-

*ملحوظة: يرجى التأكد من ان الورقة الإمتحانية عبارة عن ثلاث صفحات

مع تمنياتى بالتوفيق والنجاح

Dr. /Abeer El-Said Abdrabouh