ص ٤ ٢٠١٣/٨/٢٦

المستوى الأول - كيمياء حيوية - ع ١٢٥ الفصل

Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology (Z 125)
Courses' Nutrition

Summer Term
1st Level: Biochemistry
Date: 26-8-2013
Time Allowed: 2hr
Full Mark: (60)

Answer all Questions: Each Question [15] Mark

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

1- Carbohydrates, lipids, and proteins all contain carbon, hydrogen, and oxygen. Which one also contains nitrogen?
a- carbohydrates b- lipids c- proteins d- none of the above

2- All of these are examples of proteins in the body EXCEPT ----------
a- collagen b-hemoglobin c- lecithin d- myosin

3- All B vitamins function as ----------
a-coenzymes. b- electrolytes. c- intrinsic factors d- sources of energy.

4- Vitamin K is needed in the body for ----------
a- enzyme action. b- blood clotting. c- energy production d- carbohydrate metabolism

5- Iodide deficiency results in ----------
a- anemia. b- scurvy. c- osteomalacia. d- goiter.

6- Which of these is a disaccharide?
a- lactose b- glucose c- fructose d- galactose

7- Fibers belong to the class of nutrients known as ----------
a- carbohydrate b- protein c- lipids d- minerals.

8- If the fatty acid portion of a fat molecule has ten double bonds, the fat is said to be ----------
a- saturated b- monounsaturated c- polyunsaturated d-hydrogenated

9- In which form are most dietary lipids found?
a- steroids b- phospholipids c-triglycerides d- monoglycerides

10- Which vitamin is fat-soluble and has carotene as its precursor?
a- vitamin A b- vitamin B6 c- vitamin D d- vitamin C

B- Identify FIVE only of the following ,mention one example for each: (5 marks)
a- Polysaccharides b- Essential nutrient c- Tripeptides
d- Steroids e- Antioxidants f- Omega-3 fatty acids

Q-2) A- Fill in the blanks: (5 marks)

1- Two types of conjugated proteins are -------(1)--------- and ------(2)-------
2- Micronutrients are ------(3)------ and ------(4)---------
3- From the function of calcium are: -------(5)--------- and --------(6)----------
4- -------(7)------ is saturated fatty acid and -------(8)------- is essential amino acid.
5- A compound composed of three fatty acids attached to a glycerol molecule is called a ------(9)-------
6- Two main functions of lipids are: a- ---------(10)---------- b- ---------(11)--------

7- Two functions of water in the body are: a- ---------(12)-------- and b- -------(13)--------
8- From the symptoms of vitamin C deficiency are: ---------(14)-------- and ------(15)---------

B-Give a brief account on FOUR only of the following: (10 marks)

a-General functions of dietary minerals. b- Functions of carbohydrates
c- Synthesis and activation of vitamin D d- Types of proteins.
d- Sources of water intake and output.

Third question:

a) Write on the digestion in the stomach. 4.5 marks

b) Discuss all of the following: 10.5 marks

1- Transamination. 2- Beta oxidation.
3- Diabetes mellitus.

Fourth question:

a) Write on the following: 6 marks

1- Glucose catabolism.
2- Secretion and function of pancreatic juice

b) Define each of the following terms: 9 marks

1- Gluconeogenesis. 2- Deamination. 3- Basal metabolic rate.

Dr. El-Sayed M. El-Habibi Dr. Hanaa Serag

كيمياء صيفي ١١٢ر

قسم الرياضيات كلية العلوم جامعة المنصورة	المستوى الأول المادة: تفاضل وتكامل كود المادة: ر١١٢ برامج : الكيمياء - الكيمياء الحيوية - كيمياء وحيوان -كيمياء ونبات - جيولوجيا - جيوفيزياء - ميكروبيولوجى - علوم بيئة	الفصل الدراسي الصيفى دور سبتمبر ٢٠١٣ الزمن : ساعتان التاريخ:السبت: ٢٠١٣/٨/١٧ الدرجة الكلية : ٨٠ درجة

أجب عن الأسئلة الآتية

السؤال الأول: (٢٠ درجة)

(١) عين المجال والمدى للدوال الآتية:

$g(x) = \sqrt{x-3}$, $f(x) = \sqrt{x^2-25}$ ثم أوجد gof , fog. (١٠ درجات)

(٢) أوجد المجال والمدى للدالة $f(x) = \frac{x-2}{x+1}$ ، ثم إثبت ان لها معكوس واوجده . (١٠ درجات)

السؤال الثاني: (٢٠ درجة)

(١) إحسب النهايات الآتية: (١٢ درجة)

$(i)\ \lim_{x\to 0} \frac{e^{2x}-1}{x}$, $(ii)\ \lim_{x\to 0} \frac{1-\cos 2x}{x^2}$

$(iii)\ \lim_{x\to \infty} \left(\frac{x+3}{x}\right)^x$, $(iv)\ \lim_{x\to 0} \left(\frac{1}{x} - \frac{1}{\sin x}\right)$

(٢) أوجد قيمة الثابت A لكى تكون الدالة الأتية متصلة عند $x=0$. (٨ درجات)

السؤال الثالث: (٢٠ درجة)

(١) أوجد المشتقة الأولى للدوال الاتية: (١٢ درجة)

$(i)\ x^2 + x\sin^{-1}y = y\,e^x$, $(ii)\ y = (\sin x)^x$

$(iii)\ y = e^{-3x}\ \ln(x^3+1)$, $(iv)\ y = \tan^3(5x^2+1)$

(٢) أوجد معادلتى المماس والعمودى للمنحنى $y = x^3 - 2x^2 - 3$ عند النقطة $(x_0, y_0) = (1, -4)$.
(٨ درجات)

السؤال الرابع: (٢٠ درجة)

إحسب التكاملات الآتية:- (كل جزء ٤ درجات)

$(i)\ \int \cos^4 x\,\sin^3 x\,dx$, $(ii)\ \int_0^1 (x^3+1)^3\ x^2\,dx$

$(iii)\ \int \frac{e^{\tan^{-1}x}}{1+x^2}\,dx$, $(iv)\ \int_0^{\pi} \cos^2(3x)\,dx$, $(v)\ \int x^2 e^x\,dx$

انتهت الأسئلة ،،، مع التمنيات بالنجاح والتفوق ... أسرة التدريس...

المستوى : الأول المادة : جبر وهندسة كود المادة : (ر١١١)	كلية العلوم – قسم الرياضيات	دور: سبتمبر ٢٠١٣ الزمن : ساعتان التاريخ : ٢٠١٣/٨/١٧

البرامج: كيمياء-الكيمياء الحيوية- كيمياء وحيوان- ميكروبيولوجى- كيمياء ونبات-علوم بيئة- جيولوجيا- جيوفيزيقا

أجب عن الأسئلة الآتية: **الدرجة الكلية :** ٨٠ درجة

السؤال الأول:

أ – باستخدام مبدأ الاستنتاج الرياضي اثبت أن :

$$1^2 + 2^2 + 3^2 + \cdots + n^2 = \frac{n}{6}(n+1)(2n+1)$$ (١٠ درجات)

ب – حلل الكسر $\frac{16x+7}{(3x+1)^2(x+2)}$ إلى كسوره الجزيئية (١٠ درجات)

السؤال الثاني:

أ – عين معادلة القطع المكافىء الذى رأسه (2- , 4) و بؤرته (2- , 6) ثم اوجد طول الوتر البؤرى العمودى وكذلك معادلتى المحور والدليل مع الرسم (١٢ درجة)

ب – اوجد المقياس والسعة للعدد المركب $z = \frac{3+i}{1-3i} + \frac{2-5i}{1+3i}$. (٨ درجات)

السؤال الثالث:

أ- باستخدام طريقة كرامر اوجد حل المعادلات الآتية:

$x - 3y + z = 6$, $x + y + z = 2$, $3x + 2y + z = 3$ (١٠ درجات)

ب- اكتب معادلة القطع الناقص $16x^2 + 9y^2 - 18y + 64x - 71 = 0$ في الصورة القياسية موضحا جميع المعلومات الخاصة به مع الرسم . (١٠ درجات)

السؤال الرابع :

أ- اوجد نقطة تقاطع المستقيمين $3x - 2y + 1 = 0$, $x + 2y - 5 = 0$ والزاوية بينهما ثم اوجد معادلة المستقيم الذي يمر بنقطة التقاطع ويوازى المستقيم $2x + 3y + 7 = 0$ (١٠ درجات)

ب – اذا كانت $z = (1 - i\sqrt{3})$ اوجد قيمة $z^{\frac{4}{3}}$ (١٠ درجات)

مع أطيب التمنيات بالتوفيق: اسرة التدريس

المستوى الأول - علم تقسيم النبات (ن ١٠١) في صيولجيا - لاصوب + مجموعة البيولوجي).

Mansoura University Faculty of Science Botany Department El-Mansoura, Egypt	جامعة المنصورة كلية العلوم قسم النبات المنصورة - مصر

Final Examination in Botany

Summer Course - 2013

Educational Year: First Level

Programs :(Microbiology, Biochemistry, Zoology& Chemistry, Botany &Chemistry , Geology and Envinmental sciences) .

Subject: Botany **Course(s): Systematic Botany**

Time:2 hrs **Date: 21 / 1 /2012** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q1 Fill in the Space:

1-Cyanobacteria belong to kingdom ...., however, *Aspergillus* is related to kingdom........... (2.0)

2- Diatoms belong to phylum ...., however, *Euglena* is related to phylum .... (2.0)

3- The reserve food in chlorophyta is ...., however , reserve food in Phaeophyta is .... (2.0)

4- The cell wall in bacteria is mainly composed of .... , however , cell wall of fungi is mainly of .... (2.0)

5- yeast is classified under class .... but *Rhizopus* is classified under class .... (2.0)

6- Nutrition in fungi is .... , however, nutrition in algae is .... (2.0)

7- Nucleus in Nostoc is .... , however, nucleus in Gymnosperms is................. (2.0)

8- Bacteria that live in complete absence of Oxygen is called ...., however , bacteria require Oxygen to live is called................. . (2.0)

9- The protein coat of a virus is known as..........., However , Slime layer covering bacterial cell wall is called .... (2.0)

10- Kingdom Protista include organisms that are .... and .... (2.0)

Examiners: Prof. Abduldayem Sherief Prof. Mervat Hosny

Prof. Mohamed Ismail **Dr. Ahmed Abd El-Gawad**

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany

Summer Course - 2013

Q2 Choose the correct answer:

1-*Volvox* is of (Filamentous – colonial- Unicellular) form . (2.0)

2- Viruses are (Obligate autotrophic – Obligate intracellular parasites – Heterotrophic) . (2.0)

3- The cell wall in Diatoms is Mainly of (Cellulose – Chitin - Pectin + SiO2) . (2.0)

4- Gametangial copulation is a mode of (Sexual – Asexual – vegetative reproduction) in some Microorganisms. (2.0)

5- Lytic cycle caused by viruses lead to (complete lysis - Partial lysis – non-lysis) of bacterial cell wall. (2.0)

6- Mosses are related to(Petridophyta - Bryophyta - Dicotolydons).(2.0)

7- Bacterial movement occur by (Flagella – Fimberiae – Pilli). (2.0)

8- Isogamy means fusion of (2 equal - 2 un-equal – 2 dissimilar) gametes . (2.0)

9- Sexual reproduction in Spirogyra occur by (Fragmentation – conjugation – Motile gametes) . (2.0)

10- *Chlamydomonas* is classified under (Ascomycota- Monera – Protista) (2.0)

Q3 Write on(with illustration as possible) :

1-Life cyle of *Rhizopus* . (4.0)

2-Asexual reproduction in *Aspergillus.* (4.0)

3-Economic Importance of cyanophyta. (4.0)

4-Mode of reproduction in *Anabaena* . (4.0)

5-Living and Non-living characters in Viruses. (4.0)

Examiners: Prof. Abduldayem Sherief Prof. Mervat Hosny

Prof. Mohamed Ismail **Dr. Ahmed Abd El-Gawad**

المستوى الأول - كيمياء حيوى - فسيولوجيا ومكروبيولوجيا (ب ١٠٦)

Mansoura University

Faculty of Science

Botany Department

Date: 28 /8/2012

Final Exam for the Summer Semester 2012/ 2013

Subject: B 106

1st level of Chemistry Program

Time allowed: 2hrs

Full Questions Mark: 60 Marks

Answer the following questions:

***Q1.* Complete the missing words in the following:** **(15 Marks)**

1-Permeability is .....

2- Colloids classified into..... and .....

3- Light reaction during photosynthesis produce.....and .....

4- Permeability of non-electrolytes across the plasma membrane depends on .....

5- Osmotic suction force of a plant cell in a hypotonic solution = ...

6- Cytoplasm of plant cell is a complex.....

7- Plasmolysis defined as ..... while de-plasmolysis is.....

8- Photosynthesis is .....process.

9- Invertase enzyme catalyses the hydrolysis of ..... to .....and .....

***Q2.* Write an account on:** **(15 Marks)**

a- Fixation of CO_2 during photosynthesis (Calvin cycle).

b- Hydrolases.

c- Permeability of electrolytes by plant cells.

d- Precipitation colloids.

e- Diffusion.

(P.T.O. من فضلك اقلب الصفحة)

Q3: A. Provide the missing word or words: **(15 Marks)**

a- Bacteria belong to the kingdom.....
b- *Spirogyra* reproduces sexually by.....
c- Viruses attacking bacterial cells are known as.....
d- Bacteria that cannot grow in presence of oxygen are termed as.....
e- The cell wall of fungi contains.....

Q3: B. Choose the most correct answer:

a. Under favorable growth conditions, bacteria reproduces, mainly by:
1. binary fission 2. endospores 3. exospores 4. conidia

b. Viruses are:
1. heterotrophes 2. symbiotic 3. obligate intracellular parasites 4. all mentioned

c. The fungus *Penicillium* belongs to:
1. Chytridiomycota 2. Zygomycota 3. Ascomycota 4. Basidiomycota

d. The green alga *Chlamydomonas* is:
1. unicellular motile 2. unicellular non-motile 3. colonial 4. filamentous

e. The bacterial capsule is mainly composed of:
1. polysaccharides 2. proteins 3. lipids 4. all mentioned

Q4: A. Mention only two main taxonomic characteristics of: **(15 Marks)**

a. Kingdom Protista
b. Kingdom Fungi
c. Kingdom Monera

Q4: B. With the help of labeled diagram discuss briefly the different phases of bacterial growth

"Best of Luck"

Examiners:

Prof.Dr. Heshmat Aldesuquy Dr. Mohmed Ismail

للمستوى الأول - ب١٠٢ - علم وظائف النبات (لمصري - مجموعة البيولوجي)

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
Summer course : September. 2013

Educational Year: 1st Level **Program : Biology**
Subject: (B102) **Courses: Basics of plant Physiology**
Time: 2 hrs **Date: 28 /8/2013** **Full mark: 60**

Q1: Complete the missing in the following :- (10 marks)

1- Fixation of CO_2 into sugars in green tissues occurs through .... cycle during ....
2- In the aerobic conditions CO_2 is released through........... cycle during the process of ....
3- Fermentation of sugars under anaerobic conditions produces .... + ...
4- Light causes .... of the .... pump in the guard cells ,Where .... ions enter ,flollowed by .... of the stomata .

Q2: Choose the correct answer : (10 marks) .

1- Appearance of water drops in the early morning on leaf margins and tips is knows as (Transpiration – Guttation) .
2- NAD is considered as (Coenzyme – enzyme inhibitor) .
3- Heavy meals are considered as (Competitive inhibitors – Non.Competitive inhibitors).
4- Passive absorption of water depends on (osmotic pressure – transpiration).
5- Permeability of plant cells to ionized substances includes (Active absorption – passive absorption – or both) .
6- Amylase enzyme causes hydrolysis of (starch – fats) .
7- Accumulation of the end products causes (increase in enzyme activity – decreases enzyme activity) .
8- Terminal oxidation during aerobic respiration prouduces (ATP – H_2O – or both).
9- Aldolase enzyme causes splitting of (Fructose 1,6 – Di [P] – Fructose 6-[P])
10- Succinic dehydrogenase is (Isomerase – Transferase – Oxido reductase) .

Q3: Put (√) or (×) and Correct the wrong answer : (10 marks) .

1- Guttation is due to more water absorption at night by the root . ( )
2- Light reactions during photosynthesis consumes oxygen . ( )
3- Glycolysis causes break down of sugars into mevalonic acid . ( )

4- The starch sugar hypothesis explains the movement of stomata . ( )
5- Gelation is the conversion of Gel to Sol by cooling . ( )
6- Adsorption is a character of the colloids . ( )
7- Ca^{++} ions antagonise Na^{+} ions at the plasma membrane . ( )
8- Lyases are enzymes capable of conversion of the substrate after using water. ( )
9- The hypertonic solution causes increase in cell turgidity . ( )
10- The Competitive inhibitor of enzyme action is not similar to the substrate molecule . ( )

Q4: Write Shortly On : (30 marks)

1- The role of osmosis in plant life .
2- Krebs cycle (Diagram only)
3- External factors affecting transpiration .
4- Permeability of the plasma membrane to non electrolytes .
5- Transferase and isomerase enzymes with example .
6- Root pressure .

" Best of Luck "

Examiners: Prof.Dr.Samy Abo-Hamed
Prof.Dr.Wafaa M.Shukry
Dr. Rasha M.E.Gamal

المستوى الأول - كهربية ومغناطيسية وضوء ف ٢٠١٣

Mansoura University
Faculty of Science
Physics Department

Course code: Phys 102

September semester 2013
Date: 26-8-2013

1st Level students all Programs
Full Mark: 60
Allowed time: 2 hours
Course title:
Electricity, magnetism and optics

Answer the following questions: Marks

1- a- Calculate the electric field intensity at point P that is located at distance y on the vertical line at the mid-point of a dipole whose length is 2a. 8

b- A point charge Q is placed on the x- axis at x = 2.0 m from the origin. A second point charge, –Q, is placed at x = 3.0 m. If Q = 40 μC, what is the magnitude of the electrostatic force on a 30 μC charge placed at the origin? (K_e=9x10^9 N.m^2/C^2). 7

2- a- Define the following: 8

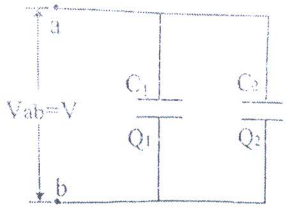
Coulomb's law – Gauss's law –Electric flux – Potential difference.

b- An insulating sphere of radius a has a uniform charge density ρ and total positive charge Q. Calculate the electric field intensity at a point outside the sphere, that is for r ⟩ a (inside the sphere) and r ⟨ a (outside the sphere). 7

3- a- Define the following: 8

refractive index -Huygens's principle– critical angle- optical path

In Figure, let C_1=6μF, C_2=3μF and V_{ab} =18 volt. Find the equivalent capacitance, the charge and potential difference for each capacitor when the two capacitors are connected 7



i - In series ii- In parallel

4- a- Discuss how the liquid refractive index is measured using Pulfrich refractometer. 8

b- A green light of wave length 546 nm traveling in air and incident on a slab of transparent material. If the incident ray makes an angle 40° with the normal, and the angle of refraction is 26°. 7

a) Find the index of refraction of the material.
b) Find the wavelength of light in the material.
c) What is the frequency in the medium? (Velocity of light C =3x10^8 m/s)

Best wishes:

Dr Hany Kamal

المستوى الأول - فيزياء حرارة وخواص مادة ف ١١

Mansoura University Faculty of Science Physics Department	Summer Exam, 2013 ***Physics***	1st Year Phys 101 Time allowed: 2 h

Answer the Following Questions

marks

1. **(a)** What is the temperature change of 25 °C in both °F and °K scale? [6]
(b) A 50 gram of a metal is heated to 200 °C and then dropped into a beaker containing 400 gram of water initially at 20 °C. If the final equilibrium temperature is 28 °C, find : [9]
i) The specific heat of metal.
ii) The total heat transferred to the water in cooling the metal.

2 **(a)** If 5 m^2 from the sun surface radiate 3.69 x 10^8 J/m^2sec, Calculate the sun temperature (Stefan`s constant is 5.7 x10-8 W/m^2K^2). [7]
(b) A brass disk has a hole 80 mm in diameter punched in its center at 82 °F. If the disk is placed in boiling water, what will be the new area of the hole? [8]
(coefficient of linear expansion α for brass = 9.75 x10^{-6} F^{-1})

3 **(a)** The acceleration ,a, of a particle moving with uniform speed v in a circle of radius r is given [4]

$$a = k\, r^{\alpha} v^{\beta}$$

determine the values of α and β.
(b) A steel wire of length 250 cm, its mass 15 gm and density 7.5 gm/ cm3. The elongation is 2mm, when 10 kgm is hung on the wire, calculate Young`s modulus. [7]
(c) Calculate the acceleration due to gravity at a point at 300 km from the earth`s surface (the diameter of the earth 1.275x10^7m). [4]

4. **(a)** At certain point in a pipeline the velocity is 1.5 m/sec and the pressure is 2 x10^5 Pa. Find the pressure at a second point in the line 4m lower than the first, if the cross section at the second point is one-half that at the first. The liquid in the pipe is water. [7.5]
b) the position of a particle moving along the x-axis is given by [7.5]
x = 0.08 sin (12t+ 0.3) m where t in second
i) find the amplitude and period of the motion
ii) Determine the position, velocity and acceleration at t = 0.6 sec.

المستوى الأول - كيمياء حيوى - كيمياء ك ١٢١

Mansoura University Faculty of Science Chemistry Department Subject: Chemistry Course(s): Chem.131 Principles of Organic Chemistry		Summer Course 1st Level Chem./Biochem. Students Dat: 19/8/2013 Time allowed: 2 Hours Full Mark: 60 Marks

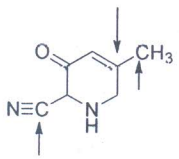
Answer the FOLLOWING questions:

[1] (a) Multiple choice. Circle the one best answer. (2 points each) [20 Marks]

1. Boron trifluoride (BF_3) is a molecule in which the boron atom is _____ hybridized and the FBF bond angle is _____.

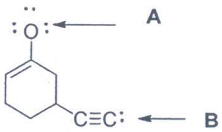
A) sp^2, 180° B) sp^2, 120° C) sp^3, 109° D) sp^3, 120° E) sp, 180°

2. From left to right , what is the hybridization of the carbon atoms in the compound below?



A) sp^3, sp, sp^2 B) sp^3, sp^2, sp^2 C) sp^3, sp, sp D) sp, sp^2, sp^3 E) sp^3, sp^2, sp

3. Assign any formal charges to the oxygen atom (A) and carbon atom (B) in the following structure respectively.

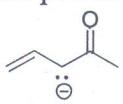


A) -1 and +1 B) –1 and –1 C) 0 and -1 D) -1 and 0 E) +1 and +1

4. Given a completed equation for the acid-base pair shown below. Which of the following represents acid/conjugate base pair in the reaction?

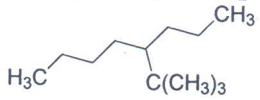
A) NH_2^-/NH_3 B) HCO_2H/HCO_2^- C) HCO_2^-/HCO_2H D) NH_3/NH_2^- E) none of these

5. How many other resonance structures are possible for the substance below?



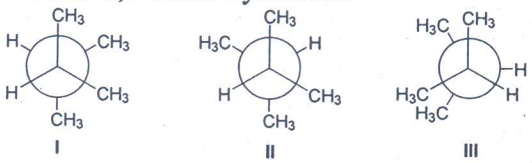
A) two B) three C) four D) five E) none

6. What is the correct IUPAC name for the compound pictured below?



A) 4- isopropyloctane B) 4- t-butyloctane C) 4-sec-butyloctane
D) 4-(2,2-dimethylethyl)heptane E) 5-t-butyloctane

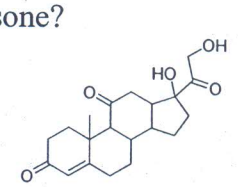
7. From the perspective of viewing down the C2- C3 bond, what is the Newman projection of the most stable conformation of 2,3-dimethylbutane?



I II III

A) I only B) II only C) I and III D) I and II E) III only

8. Cortisone (steroid) reduces swelling and decreases the body's immune response. How many different functional groups are in the following structure of cortisone?



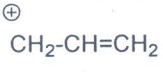
A) one B) two C) three D) four E) five

PLEASE TURN TO NEXT PAGE

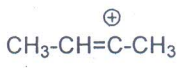
9. Which of the following is a primary alkyl halide?

A) methyl bromide B) isopropyl bromide C) *t*-butyl iodide D) cyclohexyl bromide E) isobutyl chloride

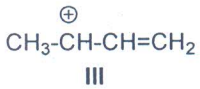
10. Which of the following represents allylic carbocation?



I



II

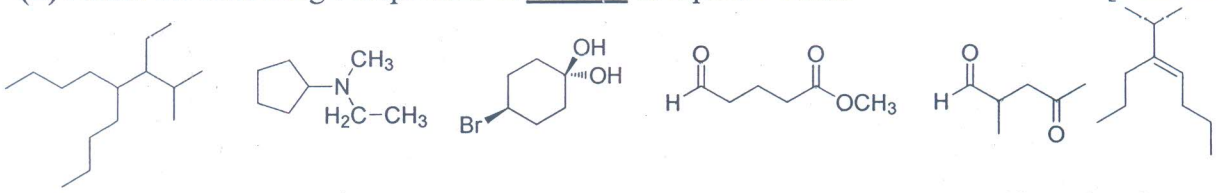


III

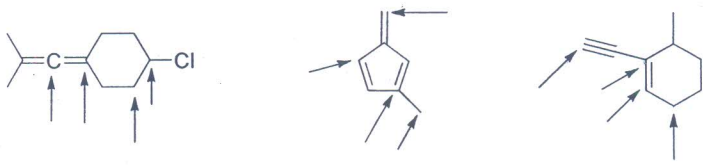
A) I only B) I and II C) I and III D) II only E) III only

[2] **(a)** If 2-methylpropane is brominated at 125 °C in the presence of light, what percent of the product will be 2-bromo-2-methylpropane? Compare your answer with the percent obtained in chlorination to give the same product. [4 Marks]

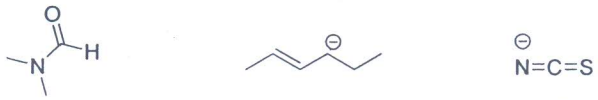
(b) Name the following compounds in **IUPAC** acceptable terms [6 Marks]



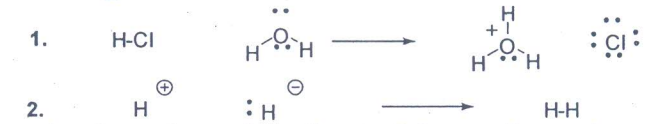
(c) Determine how many unshown hydrogens are bonded to each of the indicated carbon atoms. [6 Marks]



[3] **(a) Draw** all the other resonance structures for the following structures using arrow-pushing [6 Marks]



(b) Label the Lewis acid and Lewis base in the following reaction. Then show the mechanism of the acid-base reaction using arrows. [4 Marks]



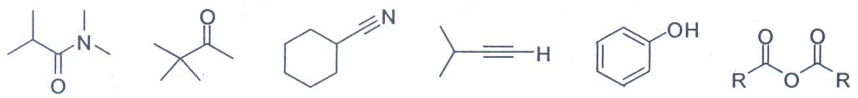
(c) Using a Newman projection, draw the all possible conformation structures for pentane, sighting down the C_2-C_3 bond. Sketch approximate potential energy diagram. [2 Marks]

[4] **(a)** Which is the **stronger acid** in the following pairs. Explain your answer [6 Marks]

(I) Phenol or *p*-hydroxybenzaldehyde (III) *o*-Fluorophenol or *p*-fluorophenol

(II) *m*-Cyanophenol or *p*-cyanophenol

(b) Name the general class of organic compounds that each of these molecules belong to [6 Marks]



Best wishes

Examiner: Dr. Ahmed Fekri

للمستوى الأول - كيمياء - كيمياء حيوية . امتحان الكيمياء غير العضوية ك ١٢١

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Chemistry** **Course(s): Chem. (121) (General and Inorganic Chem.**	كلية العلوم جامعة المنصورة	**Summer Exam** **Level 1 (Chem. & Biochemistry Program) Students** **Time Allowed: 2 hours** **Full Mark: 60 Marks** **Date:** 24, 8,, 2013

Answer The Following Questions

1.A) Choose the correct answer **(8 Marks)**

i) If the principle quantum number n=3, the angular quantum number (l) can be ....

a) 0,1 or 2 b) 0 or 1
c) 1 or 2 c) 2

ii) The bond angle in CO_2 molecule is

a) 180° b) 90° c) 120° d) 0°

iii) Hybridization of P in PCl_5 is ....

a) sp^3d^2 , b) sp^3 c) sp^3d d) sp

iv) The geometry of SF_6 is

a) unsymmetrical b) Distorted
c) Symmetrical c) Plannar

B) Draw Lewis structure of the following compounds, then predict their geometry **(8 Marks)**

ClO_3^- , BF_3, IF_4^- , Xe F_2 ($_5B$-$_8O$-$_9F$-$_{53}I$-$_{54}Xe$)

2.A) Which species give the property indicated **(7 Marks)**

i) O-H or S-H bond is more polar
ii) F^- or F is smaller in size
iii) Be or B is higher in ionization energy
iv) H or He is paramagnetic
v) Infrared or ultraviolet is higher in wave length
vi) A: [Ar] $3d^1 4S^2$ or B : [Ar] $3d^1 4S^2 4P^1$ is a transition metal

B) Calculate the wavelength (λ) in nm of the third line in Lyman's series. Does this line occur in the U.V region ?
(Rydberg's constant = 109 678 cm^{-1} , c = $3x10^8$ m/s, h=$6.62x10^{-34}$, A = $2.18x10^{-8}$ J) **(7 Marks)**

3.A) On the basis of molecular orbital theory answer the following **(8 Marks)**

a) Is He^{+} molecule stable ? ($_2$He)
b) Which molecule is paramagnetic N_2 or O_2 ? ($_7$N,$_8$O)
c) Which molecule is more stable O_2^{-} or O_2^{-} ? ($_8$O)
d) Calculate the bond order of Ne_2 ? ($_{10}$Ne)

B) Write (✓) or (X) on the following **(8 Marks)**

a) H_2O is a linear molecule
b) N_2O molecule has three resonance structure
c) The first electron affinity of $_{12}$Mg is a –ve sign value while for $_{17}$Cl, it is a +ve sign value
d) About 80% of the known elements are metals.

4.A) How many grams of CO_2 will be formed when a 4.6 gm of C_2H_5OH is ignited in oxygen ?
(Atomic weight C=12 , O = 16 , H = 1) **(7 Marks)**

B) What is the empirical formula of a compound containing 60% oxygen and 40% sulphur (S = 32 , O = 16) **(7 Marks)**