المستوى: الاول المادة : تفاضل وتكامل (ر١١٢) الدرجة الكلية : ٨٠ درجة	كلية العلوم – قسم الرياضيات	امتحان دور مايو الزمن: ساعتين التاريخ : ٢٠١٣/٥/٢٥

البرامج : كيمياء – كيمياء حيوى – حيوان وكيمياء – جيوفيزياء – جيولوجيا- ميكروبيولوجى – علوم بيئة – كيمياء نبات

أجب على الأسئلة الآتية :

السؤال الاول :

(أ) أوجد مجال ومدي الدوال الأتية ثم حدد ما اذا كانت هذه الدوال زوجية ام فردية (١٠ درجات)

(i) $f(x)=x(x-5)$ (ii) $f(x)=\sqrt{4-x^2}$

(ب) بين أن الدالة $f(x)=\dfrac{x-2}{x+1},\quad x\neq -1$ لها معكوس f^{-1} وأوجده

ثم أوجد $f\circ f^{-1}$ ، $f^{-1}\circ f$. (١٠ درجات)

السؤال الثانى :

أ) أوجد النهايات الاتية (٩ درجات)

i) $\lim\limits_{x\to 64}\dfrac{\sqrt{x}-8}{\sqrt[3]{x}-4}$ ii) $\lim\limits_{x\to 1}\dfrac{1+\cos\pi x}{x^2-2x+1}$ iii) $\lim\limits_{x\to 0}(1+x)^{1/x}$

ب) عرف أتصال الدالة عند نقطة؟ (٢ درجة)

(ج) أبحث أتصال الدالة $f(x)=\begin{cases}\dfrac{x^2-4}{x-2} & \text{if } x\neq -2\\ 5 & \text{if } x=-2\end{cases}$ (٩ درجات)

السؤال الثالث:

أ) أوجد المشتقة الاولي 'y للدوال الأتية: (١٢ درجة)

(i) $y=\sin^3(2x+1)$ (ii) $y=e^{\tan\left(\sqrt{3x-4}\right)}$

(iii) $y=(x)^{\sin x}$ (iv) $y=(\cos x)^{-1}+\cos^{-1}x$

ب) أوجد قيمة التكاملات الأتية (٨ درجات)

(i) $\int\sin^2 x\cos^3 x\,dx$ (ii) $\int\dfrac{2}{x^2-1}dx$

السؤال الرابع:

أ) أوجد معادلة المماس والعمودي للمنحني $x^2+3xy+y^2-5=0$ عند النقطه $(1,1)$. (٨ درجات)

ب) أوجد قيمة التكاملات الآتية : i) $\int\dfrac{dx}{\sqrt{x}(3+\sqrt{x})}$ ii) $\int\sin x e^x dx$

iii) $\int(\tan x+\sec x)^2\,dx$ iv) $\int_0^2 x\sqrt{4-x^2}\,dx$ (١٢ درجة)

مع أطيب التمنيات بالتوفيق

أسرة التدريس

ف ١٠٢ كهربية ومغناطيسية وضوء

Mansoura University Faculty of Science Physics Department		جامعة المنصورة كلية العلوم قسم الفيزياء

Second Term Examination June 2013

Academic Level: First Level — Program: Geo&Chem Zool&,Bio Chem,Bot,Enviro,Chem

Time: 2 Hours — Date: 1st June 2013

Subject: Electricity & Magnetism &Optics — Courses: Physics 102

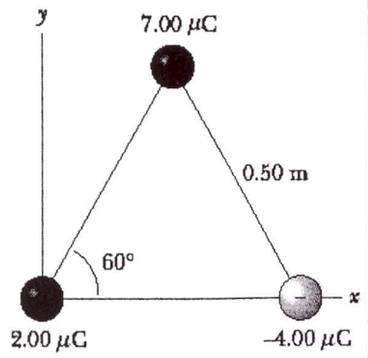
Full Mark: 60 Marks

Answer the Following Questions

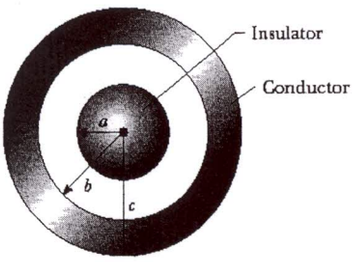
[1] a- Define the following terms: i) Electrical conductors. ii) Coulomb's law. iii) Gaussian surface. iv) The capacitor. v) Dielectrics. Vi) Magnetic force. **[6] Marks**

b- Explain the differences between Linear, Surface, and Volume Charge Densities, and give examples of where each would be used. **[3] Marks**

c- Three point charges are located at the corners of an equilateral triangle as shown in Figure. Calculate ,**i)** the resultant electric force on the 7.00 μC charge, and **ii)** The electric potential energy of the configuration. $\mathbf{K_e = 9x10^9\ N.m^2/C^2}$ **[6] Marks**



[2] a- A solid, insulating sphere of radius *a* has a uniform charge density ρ and a total charge ***Q***. Concentric with this sphere is an uncharged, conducting hollow sphere whose inner and outer radii are *b* and *c*, as shown in Figure. (a) Find the magnitude of the electric field in the regions ***r < a, a < r < b, b < r < c,* and *r > c***. (b) Determine the induced charge per unit area on the inner and outer surfaces of the hollow sphere. **[6] Marks**



b- List several similarities and differences in electric and magnetic forces. **[3] Marks**

c- Two capacitors, C_1 = 5 μF and C_2 = 12 μF, are connected in parallel, and the resulting combination is connected to a 9.00-V battery. (a) What is the equivalent capacitance of the combination? What are (b) the potential difference across each capacitor and (c) the charge stored on each capacitor and (d) the energy stored in each capacitor? **[6] Marks**

[3] a-. Determine the velocity, radius of path, and the periodic time for a proton moves freely with a constant velocity **v** perpendicular to a constant magnetic field **B**. **[7] Marks**

b- Two long, parallel conductors, separated by 10 cm, carry currents in the same direction. The first wire carries current I_1 = 5 A, and the second carries I_2 = 8 A. (a) What is the magnitude and direction of the magnetic field created by I_1 at the location of I_2? (b) What is the force per unit length exerted by I_1 on I_2? (c) What is the magnitude and direction of the magnetic field created by I_2 at the location of I_1? $\mu_o = 4\pi \times 10^{-7}$ **T.m /A** **[8] Marks**

[4] a- Define the following terms: i) Wave front. ii) Law of reflection. iii) Index of refraction. iv) Critical angle. **[4] Marks**

b- Use Huygens's principle to drive the Snell's law of refraction **[5] Marks**

c- The wavelength of red helium–neon laser light in air is 632.8 nm. (a) What is its frequency? (b) What is its wavelength in glass that has an index of refraction of 1.50? (c) What is its speed in the glass? $\mathbf{C = 3 \times 10^8\ m/s}$, $\mathbf{n_{air} = 1}$ **[6] Marks**

Examiners: 1-Dr. Nabil Kinawy 2- Dr. Maysa Ismail 3- Dr. Nagah Elsheshtawy 4- Dr. Hany Kamal

Mansoura University Faculty of Science Chemistry Department Subject: Chemistry Course(s): Chem.131 Principles of Organic Chemistry		Second Term 1st Level Chem./Biochem. Students Date: 04/6/2013 Time allowed: 2 Hours Full Mark: 60 Marks

Answer the FOLLOWING questions:

[1] (a) Rank the following according to [14 Marks]

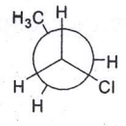
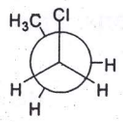
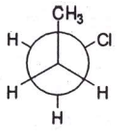
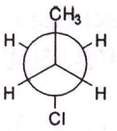
i. increasing solubility in water

$CH_3CH_2CH_2CH_3$ $CH_3CH_2OCH_2CH_3$ CH_3CH_2OH CH_3OH

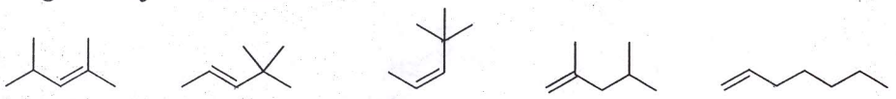
ii. increasing dipole moment (μ)

H–F H–Br H–I

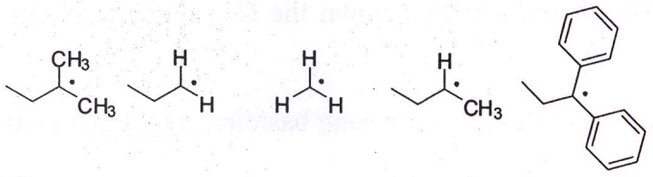
iii. decreasing Torsion strain

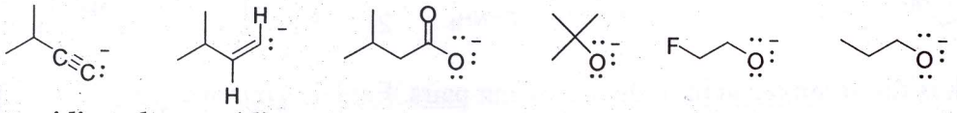
iv. increasing heat of combustion



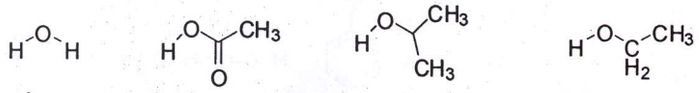
v. increasing stability



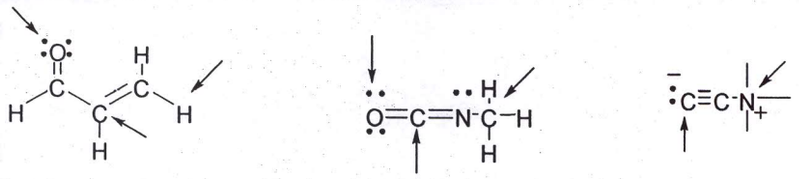
vi. increasing basicity



vii. most acidic to least acidic

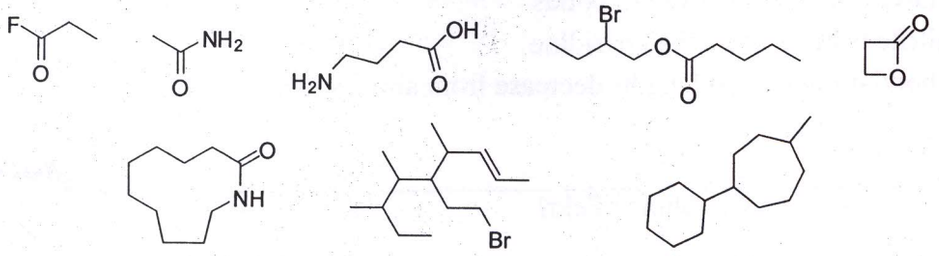


(b) Predict the hybridizations, geometries, and bond angles for each of the atoms where indicated in the shown molecule. [4 Marks]



[2] (a) Draw out the product(s) formed when 1,2-dimethylcyclohexane undergoes 1) chlorination and 2) bromination under free radical conditions and predict the percentage of each product formed. [4 Marks]

(b) Name the following compounds in **IUPAC** acceptable terms [8 Marks]



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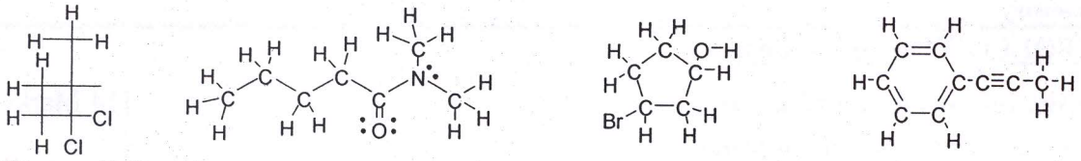
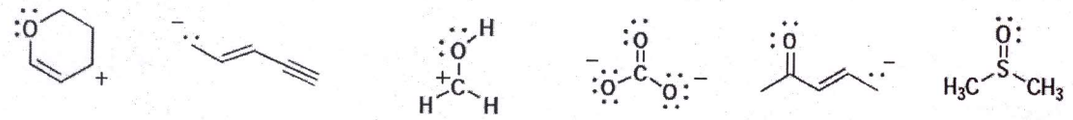
(c) Draw the line-bond representation for the following Lewis structure [2 Marks]

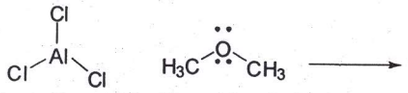


[3] (a) Draw all the other resonance structures for the following structures using arrow-pushing [6 Marks]



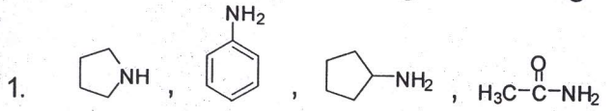
(b) Label the acid and base in the following reactions. Then show the mechanism of the acid-base reaction using arrows. [4 Marks]

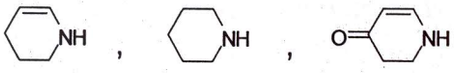
1. 

2. 

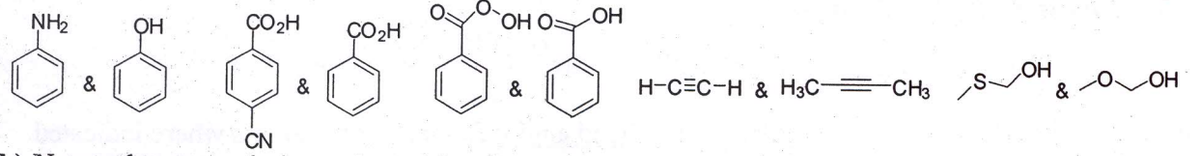
(c) Using a Newman projection, draw the least and the most stable staggered conformation for 1,1-dibromo-2-chloroethane, sighting down the C_1-C_2 bond. Sketch approximate potential energy diagram. [2 Marks]

(d) Rank the following according to increasing basicity. Explain your answer [2 Marks]

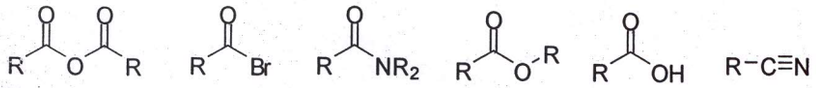
1. 

2. 

[4] (a) Which is the **stronger acid** in the following pairs. Explain your answer [5 Marks]



(b) Name the general class of organic compounds that each of these molecules belong to [3 Marks]



(c) True or Fulse [6 Marks]

1. Carboxylic acids are proton donor
2. Carboxylic acids are Lewis acids
3. Primary amides have an sp hybridized Nitrogen atom
4. Nitriles have 2 σ and 1 π covalent bonds
5. Ethanenitrile is more basic than pyridine
6. The Carbon/Nirogen bond lengths decrease from amines to amid

Best wishes

Examiner: Dr. Ahmed Fekri

علم الحاسب ع ١٠١

جامعة المنصـــورة
كليـــة العلـــــوم
قســـم الرياضيـــات

الاختبـــــار النهائى
الفصل الدراسي الثانى
دور مايو ٢٠١٣

طلاب المستوى الأول بكلية العلوم / المادة: علم الحاسب (ع١٠١)
برامج : الكيمياء – الكيمياءالحيوية - علوم البيئة – الجيولوجيا – ميكروبيولوجى – كيمياءونبات - كيمياءوحيوان
اليوم - التاريخ: السبت - ٠٨ /٢٠١٣/٠٦ الزمن: ساعتان

الدرجة الكلية: ٦٠ درجة

أجب عن جميع الأسئلة الآتية:

السـؤال الأول: كل جزئية (درجتان)

أ) أوجد قيمة X فى كل مما يأتى:

(i) $(59.125)_{10} = (X)_2$ (ii) $(122.5)_{10} = (X)_8$

(iii) $(982.8125)_{10} = (X)_{16}$

ب) أوجد قيمة X فى كل مما يأتى (قم بالتحويل بعد اجراء العملية الحسابية فى النظام المعطى): كل جزئية (٤ درجات)

(i) $(63.4)_8 \times (7.2)_8 = (X)_{16}$ (ii) $(3BA.D2)_{16} + (2E.2)_{16} = (X)_8$

(iii) $(1011011)_2 \div (101)_2 = (X)_{16}$

السـؤال الثانى: كل جزئية (٧ درجات)

أ) ارسم مخطط سير العمليات ثم اكتب برنامج بلغة QBASIC ليحسب المجموع :

$$S = \frac{3}{4} - \frac{5}{6} + \frac{7}{8} - \cdots\cdots - \frac{17}{18} + \frac{19}{20}$$

ب) ما هى مخرجات البرنامج التالى عندما K=3, N = 20

```
INPUT N , K : M = 1
DO UNTILL M > N
   R = M – K * INT (M / K)
   IF R < > 0 THEN 100
   PRINT M;
100 M = M+1
   LOOP
   END
```

جـ) ما هى مخرجات البرنامج التالى

```
A = 1 : B = 1
PRINT A; B;
FOR M = 3 TO 10
   C = A + B
   PRINT C;
   A = B
   B = C
NEXT M
END
```

السـؤال الثالث: كل جزئية (٧ درجات)

أ) ارسم مخطط سير العمليات ثم استخدام حلقة WHILE ..... WEND فى كتابة برنامج بلغة QBASIC لايجاد حاصل الضرب $F = 1\times4\times7\times10\times\cdots\cdots\times19$

ب) ارسم مخطط سير العمليات ثم اكتب برنامج بلغة QBASIC لحساب قيمة f(x) من العلاقة:

$$f(X) = \begin{cases} x^2 - 16 & ; \quad x < -4 \\ \sqrt{-x(x+4)} & ; \quad -4 \le x < 0 \\ \frac{180}{\pi}\tan^{-1}x & ; \quad x \ge 0 \end{cases}$$

علما بأن البرنامج يطلب ادخال قيمة x فى البداية.

جـ) ما هى مخرجات البرنامج التالى

```
FOR I = 1 TO 4
   S=0
   FOR J = 1 TO 5
      a = 2*I – 3*J : S=S+a
      PRINT a;
   NEXT J
   PRINT S : PRINT
NEXT I
END
```

مع أطيب التمنيات بالتفوق،
أسرة التدريس.

الكيمياء العامة والكيمياء الكهربية - امتحان الكيمياء العامة فيزيائية ك ١٢١

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

Answer The Following Questions

1.A) Draw Lewis structure of the following compounds, then predict their geometry.
ClO_4^-, NH_3, HCN, $OCCl_2$ [$_8O$,$_7N$,$_6C$,$_1H$,$_{16}Cl$] **[8 Marks]**

B) Calculate the wave length (nm) of the second line in Balmer's series. Does this line occur in the visible region ?
(Rydberg's constant = 109678 cm^{-1}, C=3x10^8 m/s , h=6.62x10^{-34}, A = 2.18x10^{-8} J).
[7 Marks]

2. A) Choose the correct answer

i) The noble gases have outer electronic configuration ?
a) $ns^2\ np^5$ **b)** $ns^2\ np^6$ **c)** $ns^2\ p^4$ **d)** $ns^2\ np^3$

ii) The quantum number (l) gives
a) The shape of the subshell **b)** The orientation of the orbital
c) The spin state of the electron
d) The relative average distance of electrons from the nucleus.

iii) The pi(Π) bonding molecular orbital may be formed by the overlape of :
a) s-atomic orbitals **b)** p-atomic orbitals side to side
c) p-atomic orbital head to head **d)** non of thesis correct

iv) The element with electronic structure $1s^2\ 2s^2\ 2p^1$ is ....
a) in the third period **b)** an s-block element
c) a metal **d)** in the third group. **[8 Marks]**

B) How many molecules are there in 63 gram AlF_3 ?
(Al = 27 , F = 19) Avogadro's number =6.02x10^{23} **[7 Marks]**

3.A) An organic compound contains only carbon, hydrogen and oxygen. This compound composed of 37.5%c and 12.5% H by mass. What is the empirical formula of this compound. (C=12, H=1,O=16) **[7 Marks]**

B) Write (✓) or (X) on the following
a) CO_2 is a polar molecule
b) Bond angle in H_2O is less than 120
c) NO_3^- molecule has two possible resonance structure.
d) The first electron affinity of Be is a +ve sign value while for F, it is a-ve sign value

[8 Marks]

4. A) On the basis of molecular orbital theory answer the following

a) Which molecule is more stable NO or NO^+ ?

b) Which molecule is paramagnetic B_2 or C_2 ?

c) Is Be_2 molecule stable?

d) Calculate the bond order of C_2^{--} **[8 Marks]**

B) Which species give the property indicated

i) C-F or C-Cl is more polar

ii) Mg or Mg^{2+} is smaller in size

iii) Li or Be atom is paramagnetic

iv) N or O is higher in ionization energy

v) Cl_2 or Br_2 molecule has shorter bond length

vi) F or F^- is diamagnetic

vii) Energy of **s**-electrons or p-electrons is not affected by the magnetic field.

[7 Marks]

Examiners :

Prof. Dr. M.M. Bekheit

Dr. A. Lutfi

مجموعة البيولوجي - اساسيات علم وظائف الأعضاء ب١٠٢

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
Second Term: May. 2013

Educational Year: 1st Level **Program : Biology**
Subject: (B102) **Courses: Basics of Plant Physiology**
Time: 2 hrs **Date: 11/6/2013** **Full mark: 60** **Question mark: 15**

Answer the following questions:

Q1 i- Put right (√) or wrong (x) for the following statements and correct the Wrong. **(10 marks)**

1- Osmosis is the movement of solute from hypotonic to hypertonic solution. ( )

2- In enzymic reactions , the accumulation of the end products increase the rate of reaction . ( )

3- The true solution contains an electric double layer . ( )

4- The movement of water between plant cells depends on osmotic pressure only . ( )

5- Active absorption of water depends on evaporation . ( )

6- High concentration of alcohol or ether causes irreversible increase in permeability . ( )

7- As soon as plant cell becomes saturated with water , the suction force becomes zero .

8- Plant cell becomes plasmolysed when put in isotonic solution . ( )

9- The state of Gel converts to Sol by decreasing temperature . ( )

10- The permeability of electrolytes by passive transport according to simple law of diffusion. ( )

ii- Complete the missing words in the following . **(5 marks)**

a-Ion antagonism between similar ions is due to ....
....

P.T.O. (من فضلك أقلب الصفحة)

b-The ascent of sap depends on the following forces .....
.....

c-The protoplasm is characterized as a colloidal solution because of the following properties.....
.....

d- Active transport of ions is mediated by.....

e- Two roles of osmosis in plant life .....

Q2 Write an account on the following : (15 marks)

a- Light reactions during photosynthsis .

b- Mechanism of closing and opening of stomata.

c- The pathway of pyruvic acid for aerobic respiration.

Q3 Discuss briefly : (15 marks)

a- The factors affecting water absorption .

b- Breakdown of glucose into ethyl alcohol .

c- Calvin cycle.

Q4 Compare between each two pairs : (15 marks)

1-Competitive and non-competitive inhibitors.

2- Oxidases and peroxidases.

3-Effect of temperature on the permeability and enzyme activity.

" Best of Luck "

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