Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Physical Chemistry** **Course (s) : Chem. 141**		**2nd Term Exam** **1st level students** **Date :1st June 2009** **Time Allowed : 2 hours** **Full Mark : 60 Marks**

Answer the following questions

[15] Marks

[1]a- For the reaction: $A + 1/2\ B = 3/2\ C + 47.5\ KJ$; $K_c = 4.3 \times 10^{-5}$

What will be?

(i) The value of ΔH for the reverse reaction. (3 marks)

(ii) The value of K_p of the reverse reaction. (3 marks)

(iii) The influence of pressure on this equilibrium. (3 marks)

b- A solution made by dissolving 4.0g of a solute in 50 g of benzene, freezes at 3.74 °C. If the freezing point of the pure benzene is 5.48 °C. Calculate the molecular weight of the solute ($K_f = 5.12$ °C). (6 marks)

[15] Marks

[2]a- Prove that: $K_p = K_c (RT)^{\Delta n}$. (6 marks)

b- State which of the following statement is correct and which is wrong. Then correct the wrong one.

(i) At STP, NH_3 will effuse (diffuse) faster than H_2. (3marks)

(ii) For oxalic acid ($C_2O_4H_2$), the K_{a2} is greater than K_{a1}. (3marks)

(iii) The vapour pressure of solution will be less than expected from Raoult's law, if the attraction between different molecules is higher than between similar one.(3 marks)

[15] Marks

[3]a- Give a full account on: (i) Graham's law of effusion (3marks) (ii) Hess's Law (3 marks)

(iii) Bond energy (3 marks)

b- One mole of CO_2 occupies a volume of 1.32L at 48 °C. Experimentally its pressure was found to be 18.4 atm. Illustrate by the calculation which P will be quite close to 18.4 atm. Either by general gas equation or by applying Van-der Waals equation; knowing that $a = 3.6\ l.^2atm.mol^{-2}$ and $b = 0.043\ l\ atm^{-1}$. (6 marks)

[15] Marks

[4] a- Write briefly on: (i) Buffer solution (3 marks) (ii) K_w (2 marks)

(ii) Van Hof's factor (2 marks)

b- Choose the correct answer:

(i) For a mixture of two gases composed of 50% each. (2 marks)

(1)$X_1=X_2$ (2) $X_1/X_2=1$ (3) $X_1+X_2=1$ (4) All of them.

(ii) When one mole of H_2 gas has been cooled under very high pressure. (2 marks)

(1)The H_2 gas will be liquefied. (2) The H_2 gas will behave similar to ideal gas.

(3) The molecular speed of H_2 molecules will be increase.

(iii) The pH of a 0.49 M acid solution whose $K_a = 4.53 \times 10^{-9}$ will be (2 marks)

(1) 4.33 (2) 5.22 (3) 4.02

(iv) Which of the following items when dissolved in water has the highest concentration of magnesium ion? (2marks)

(1) MgF_2 ($K_{sp} = 6.5 \times 10^{-9}$) (2) $MgCO_3$ ($K_{sp} = 1.8 \times 10^{-11}$)

(3) $Mg_3(PO_4)_2$ ($K_{sp} = 1 \times 10^{-25}$)

Best wishes

Prof. Y. El-Awady, Prof. A.S. Fouda, Prof. A.I. El-Kholy, Dr. A. El-Dafrawy and Prof. A.A. El-Shafei

جامعة المنصورة كلية العلوم - قسم الرياضيات المادة: رياضيات أساسية تفاضل وتكامل (ر112)		امتحان دور مايو2009م الفرقة الأولي – المستوي الأول: برامج* الزمن: ساعتان - التاريخ:2009/5/27 الدرجة الكلية: 80 درجة

*برامج: كيمياء –وكيمياء ونبات – ميكروبيولوجي – كيمياء حيوي – جيوفيزياء – جيولوجيا – كيمياء وحيوان – علوم البيئة

أجب عن الأسئلة الآتية

السؤال الأول: (20 درجة – 5 درجات لكل جزء)

(أ) أوجد مجال تعريف ومدي الدالة $f(x)=\sqrt{4-x^2}$

(ب) أوجد معكوس الدالة $f(x)=\dfrac{3}{2x-5}$

(ج) أوجد النهاية $\lim\limits_{x\to 1}\left[\dfrac{2}{1-x^2}-\dfrac{1}{1-x}\right]$

(د) أوجد النهاية $\lim\limits_{x\to 0}\dfrac{3^x-1}{x}$

السؤال الثاني: (20 درجة)

(أ) أوجد $\dfrac{dy}{dx}$, إذا كانت $y=\dfrac{(1+x)^5\sqrt{x^3+2}}{(x-1)^3(x^2+1)}$ [6]

(ب) أوجد قيمة الثابت A , بحيث تكون الدالة $f(x)=\begin{cases}\dfrac{x^2-4}{x-2} & x\neq 2\\ A & x=2\end{cases}$, متصلة عند $x=2$ [6]

(ج) أوجد معادلتي المماس والعمودي للمنحني $y=f(x)=\sqrt{2x+1}$, عند النقطة $(4,3)$. [8]

السؤال الثالث: (20 درجة- 5 درجات لكل جزء):

أوجد المشتقة الأولي $\dfrac{dy}{dx}$ لكل من الدوال الآتية:

(أ) $y=\operatorname{sech}\left(\cos^{-1}2x\right)$

(ب) $\cos(xy)=y^2+x$

(ج) $y=2\ln(\cot t),\ x=\tan t+t^3$

(د) $y=x^{\sec x}$

السؤال الرابع: (20 درجة- 5 درجات لكل جزء):

احسب التكاملات الآتية:

(أ) $\int_1^2\dfrac{x^3-3x^2+1}{\sqrt{x}}dx$

(ب) $\int\dfrac{\sqrt{9-x^2}}{x^2}dx$

(ج) $\int xe^{5x}dx$

(د) $\int\dfrac{2x-8}{x^2-3x}dx$

مع أطيب أمنيات أسرة التدريس بالتوفيق

Mansoura University
Faculty of Science
Zoology Department

First year- Biology
Subject: Taxonomy
Date: 30 May 2009
Time Allowed: 2hr
Total mark: 60 degree

Answer All the questions with labelled diagram

Question One: (15 degree)

Write about the general characters of phylum nematode, and describe the life cycle of two examples of this phylum.

Question Two: (15 degree)

Write briefly on General characters, classification and economic importance of annelida, arthropoda, mollusca and echinodermata.

Question Three: (15 degree)

Write short notes on three only of the following:

A- General characters of protozoa.

B- Nutrition and locomotion of *Euglena viridis*.

C- Nutrition and reproduction in sponges.

D- Reproduction and life cycle of *Entamoeba histolytica*.

Question Four: Answer three only of the following: (15 degree)

A- With labeled diagrams only illustrate the following: Metacercaria of *Fasciola* – Sea anemone- Cercaria of *Schistosoma*- Egg of *Ascaris*- Hexacanth of *Taenia* and isolated polyp of *Alcyonium*.

B- How can you diagnose the infections of *Fasciola*, *Schistosoma*, *Taenia*, *Ascaris* and *Ancylostoma*.

C- Compare between the medusa of *Obelia* and that of *Aurelia*.

D- Give an account on life cycle of *Fasciola* or *Taenia* or *Schistosoma*.

With best wishes of success,

Dr. Sayed A. El-Tantawy **Dr. Mohamed F. Abdelal** **Dr. Sherif Ramadan**