	Tanta UNIVERSITY Faculty of Science Department of CHEMISTRY		
	Examination of second level (General Chemistry students)		
	Course title:	Chemical Thermodynamics	Course Code: CH2141
Date	25 Dec. 2017	Total Assessment Marks: 100	Time allowed: 2 hours

Answer the following questions (20 marks)for each question)

1- Write only the mathematical equations for the following (define each term):

(a) The First law of thermodynamics for different processes.

(b) The relation between heat content (ΔH) and the temperature.

(c) Reversible work for isothermal expansion of a gas at constant pressure and for ideal gas .

(d) The relation between T, V and P for adiabatic processes.

(e) The relation between ΔS and ΔG.

2- **(i)** define the spontaneous and the non-spontaneous process and indicate whether the following Processes is spontaneous or non-spontaneous.?

(a) The transformation of heat from hot body to the surrounding.

(b) The transformation of liquid water to ice.

(c) The removing of the rusting of an iron pipe exposed to atmosphere.

(d) The combustion of gasoline.

(e) Sugar dissolving in water.

(ii) A system suffers an increase in internal energy of 80 Joule and at the same time has 50 Joule of work done on it. What is the heat change of the system

3- **(i)** 2 moles of an ideal gas of 20 liters in vessel at 27°C is compressed isothermally and reversibly to 10 Liters. Determine: ΔE, W, Q, ΔS and ΔG for this process. R= 2 cal $K^{-1}mol^{-1}$

(ii) Explain briefly, why?

a- $\Delta S = 0$ for adiabatic processes. b- $\mu_{J.T} = 0$ for ideal gases

c-The heat engine cannot convert heat to work isothermally

4- **(i)** A quantity of air at 25°C is expanded adiabatically and reversibly from pressure of 200 atm. to 20 atm. Assuming ideal behavior and c_v = 5cal/mole degree for air. Calculate the final temperature and the work done. R= 2 cal $K^{-1}mol^{-1}$

(ii) Choose the correct answer:

(a)In isothermal processes:

(i) dV= 0 (ii)) dQ= 0 (iii)) dW= 0 (iv)) dE= 0

(b) For ideal gases:

(i) $c_p = c_v$ (ii)) $c_p < c_v$ (iii) $c_p + c_v = R$ (iv) $c_p - c_v = R$

(c) The enthalpy () is equal to:

(i) E+ PT (ii) G + PV (iii) E + PV (iv) S + PV

5- **(i)**Define the following:

(a) The Joule -Thomson effect

(b) The intensive and extensive properties of the thermodynamic systems.

(ii) An engine operates between two thermal reservoirs at 100 °C and 0 °C. If 1000J of heat absorbed from the worm reservoir. Determine the change in the internal energy and the efficiency of this engine.

Good Luck

Examiner: Prof. Dr.: H. El-Daly and Assist. Prof. Dr.: M.H.Shaaban

	Tanta University Faculty of Science Department of Botany			
	EXAMINATION for level 2 Students of Chemistry /Botany and special Botany			
	Course title:	General Plant Ecology		Course Code: BO 2101
Date: Jun	2018	Term: FIRST	Total assessment Marks: 150	Time ALLOWED:2 ours

النظام البيئي

السؤال الأول:- (20 درجة)

أ- مالفرق بين مما ياتي: (10 درجات)

1- نظام بيئي مائي وارضي.
2- أنماط التوزيع للجماعة مع الرسم.

ب- عرف ما يأتي: (10 درجات)

النترتة – الاهرامات البيئية – الانتاجية الثانوية – الذبال - التأزوت

السؤال الثاني:- (35 درجة)

أ- أكمل:- (15 درجات)

1- مكونات النظام البيئي اللاحيائي هي .....و.....و.....
2- تبدأ السلسلة الغذائية النثارية بـــ.....وتنتهي بـــ.....
3- جماعة الاختيار r هو.....بينما جماعة الاختيار k هو.....
4- تعرف الانتاجية الاولية الكلية ب:..... والانتاجية الاولية الصافية ب :.....
5- معدل التوالد هو.....ومعدل الوفيات هو.....

ب- قارن بين كل مما يأتي: بالرسم والبيانات فقط. (20 درجة)

1- السلسلة الغذائية الرعوية والنثارية.
2- الشبكة الغذائية المائية والارضية.
3- منحني النمو الاسي والسيجمويدي للجماعة.
4- مسري الطاقة ذو الشعبتين.

السؤال الثالث:- ناقش كلا من : (20 درجة)

1- كيفية قياس الإنتاجية في النظام البيئي. (10 درجات)
2- يمثل التركيب العمري صفة هامة من صفات الجماعة والتي تدل علي الصفات التركيبية العمرية والحجمية للجماعة. اشرح هذه العبارة موضحا الفرق بين التركيب العمري والحجمي للجماعة مع ذكر بعض الاستدلالات لهذه الصفات. (10 درجات)

Chemistry Department Faculty of Science Tanta University	**Final Examination** **for 2nd grade students** **(Double Major Students)** December 2017, Fall semester	Course title: Organic Chemistry 1 Course Code: CH2143 Exam time: 2 hours Assessment Mark: 100 M

Answer ALL the following questions.

1- Convert the following (use chemical equations to describe your answer) (25 Marks, 5 marks each)
   a- From Benzene to Picric acid
   b- From Phenol to 2,4,6-trinitrotoluene
   c- From Toluene to *n*-propylbenzene
   d- From Aniline to *meta*-bromoaniline
   e- From Benzoic acid to *para*-methyl acetophenone

2- Write down about (use chemical equations to describe your answer) (25 Marks, 5 marks each)
   a- Kolbe-schmidt reaction
   b- Replacement of sulphonic group of benzenesulphonic acid by other groups (give three examples)
   c- Acylation mechanism of nitrobenzene
   d- Preparation of Diphenyl thiourea from aniline
   e- Mechanism of *para*-hydroxyazobenzene formation

3- Explain briefly the following: (25 Marks)
   a- Differentiation between 1°, 2° and 3° aromatic amines (5 Marks)
   b- The aromaticity of:- (15 Marks, 3 marks each)
      i. Furan
      ii. Cyclopentadiene anion
      iii. Cyclopropyl cation
      iv. Benzene
      v. Anthracene
   c- The use of phenylmagnesium bromide to prepare aromatic alcohols (5 Marks)
      (give three different examples)

4- Discuss the following: (25 Marks)
   a- The mechanism of chlorination of phenol, showing why the hydroxyl group is *ortho*- and *para*- directing group. (5 Marks)
   b- The synthetic route of the following: (20 Marks, 5 marks each)
      (start from Benzene or Toluene)
      i. Halazone
      ii. Acetanilide
      iii. *ortho*-nitroaniline
      iv. *meta*-chlorobenzenoic acid

---------- انتهت الأسئلة ----------

Good Luck

Examiners: Prof. Dr. Mohamed Berber and Prof. Dr. Abdel Basset Mursi

TANTA UNIVERSITY
FACULTY OF SCIENC
CHEMISTRY DEPARTMENT

FINAL EXAM FOR 2nd LEVEL STUDENTS (ALL SECTIONS)			
COURSE TITLE	CHEMISTRY OF THE MAIN GROUP ELEMENTS		TIME ALLOWED 2 H
CODE	CH2107		
DATE: JAN 3, 2017	TERM: FIRST	TOTAL ASSESSMENT MARKS	100

[I]. Give reasons for the following. **(20 Marks)**

1- Water has abnormal low volatility and the stability of hydrides decreases down group VI
2- Silanes are strong reducing agents, but alkanes are chemically unreactive.
3- Li and group II metals form nitrides on heating in air
4- PCl_5 is known but PH_5 is not.

[II]. Draw and explain the structure of the following: **(20 Marks)**

1- Phosphorus trioxide and pentaoxide
2- Orthoborates and metaborates
3- Beryllium halides and hydrides
4- Diborane
5- Silicones

[III]. Rank "FOUR ONLY" of the following series from high to low according to the given criteria and explain reasons: **(20 Marks)**

1- $NaCl, MgCl_2, AlCl_3$ (Polarization and polarizability)
2- NH_3, PH_3, AsH_3 (Donor properties and stability)
3- HF, HCl, HBr, HI (Acidity Strength)
4- BF_3, BCl_3, BBr_3 (Lewis acid strength)
5- Li, K , Cs (Reaction with water)

[IV]. Compare between the following: **(20 Marks)**

1- Trimethylamine and trisilyamine in structure and donor properties.
2- Group I and II elements in softness.
3- Diamond and Graphite.
4- SO_3, SO_2 and SeO_2

[V]. Choose the correct answer "FIFTEEN ONLY" with REASON: **(20 Marks)**

1- In which of the following compounds, nitrogen exhibits lowest oxidation state?
a- $H NO_3$ b- N_2H_4 c-N_2 d- NH_2OH e- NH_3

2- Which of the following contains P - O - P bond?
a- Tripolyphosphoric acid c- Hypophosphorous acid
b- Pyrophosphoric acid d- a and b

3- Which of the following compound is ionic?
a- PCl_5 b- CCl_4 c- PbF_4 d- $PbBr_4$

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY **Final Examination of for second year students (Double major)**			
	COURSE TITLE	Organic Chemistry 2		COURSE CODE: CH2111
DATE:	JAN. 2018	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions: **(Each question 25 marks)**

1] Correct by equations each of the following:

i) Ozonolysis followed by hydrolysis of isobutene gives acetaldehyde and formaldehyde.

ii) Alkaline hydrolysis of 1,1-dichlorobutane and /or 2,2- dichlorobutane forms the same product.

iii) Treatment of a mixture of benzaldehyde and formaldehyde with NaOH gives sodium benzoate and methyl alcohol.

iv)Acetic anhydride formation is the reaction of silver acetate with ethylchloride.

v) Secondary alcohol is formed from the reaction of Grignard reagent with formaldehyde.

2] A) Carry out the following conversions:

i) Acetylene into 5-methyl-2-hexyne. ii) Acetone into Acetic acid.

iii) Ethylene into tartaric acid.

B) Tow hydrocarbons of the M.F. C_6H_{12} are treated separately with acidify $KMnO_4$, in one case, the products are butanone and acetic acid; in the other case, the products are 3-methylbutanoic acid, carbon dioxide and water. Write their structures by using equations.

3] A) Explain by equations, what is the action of:

a- Aqueous KOH b-Ammonia

On each of the following compounds

i) β- and γ –Chlorobutyric acid ii) Acetaldehyde

iii) Ethylchloride iv) Ethylacetate