	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 $c_v = 5$cal/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-Dally and Prof. Dr. M.H.Shaaban

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

Answer <u>ALL</u> the following questions.

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

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 (5 Marks)
      hydroxyl group is ortho- and para- directing group.
   b- The synthetic route of the following: (20 Marks, 5 marks each)
                         (start from <u>Benzene</u> or <u>Toluene</u>)
      i. Halazone
      ii. Acetanilide
      iii. ortho-nitroaniline
      iv. meta-chlorobenzenoic acid

------------------------------ انتهت الأسئلة ------------------------------

Good Luck

Prof. Dr. Mohamed Berber and Prof. Dr. Abdel basset Morshedy

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF ZOOLOGY
EXAMINATION FOR (SECOND YEAR) STUDENTS OF CHEMISTRY/ENTOMOLOGY

COURSE TITLE:	Economic Entomology	COURSE CODE: EN2123

DATE 30/12/2017	DECEMPER 2017	FIRST TERM	TOTAL MARKS:100	TIME ALLOWED: 2 HOURS

Section 1

(الامتحان فى ورقتان)

A-State whether the following sentences are ture (√) or false (×), correct the false one: (1 mark each, total 10 marks)

1- Aesthetic value of insects comes only from their shape, color and pattern. ( )
2- The stings of honey bees have medical value for diseases such as influenza. ( )
3- Silk worm adults feed on mulberry leaves and lay 20-50 eggs ( )
4- A larva of silk worm enclose itself in a cocoon which consists of many natural silk threads. ( )
5- Honey is truly an insect product while beewax is a natural secretion. ( )
6- Beewax is used for manufacturing candles, dental impressions and crayons. ( )
7- The lac insects produce shellac to harden the host plant. ( )
8- The light produced by the bodies of fireflies is visible. ( )
9- Cochineal dye is derived from the pulverized bodies of the cochineal bugs which feed on plant galls. ( )
10- Chalcid wasps attack hosts in orders Lepidoptera, Coleoptera and Diptera. ( )

B-Give short notes on the following: (each 5 marks, total 40 marks)

1- Main differences between insect parasites and predators (give two examples in details).
2- Soil insects gain benefits from the soil and benefit the soil.
3- Insects can serve as scavengers.
4- Gall insects are considered to be beneficial and harmful to human economy.
5- The importance of insects in scientific research
6- Ischneumon wasps are beneficial for human economy
7- The importance of insects in plant pollination.
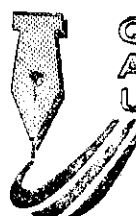8- The economic importance of shellac.

Section 2

A- Correct the following underline words (Total 20 Marks, 2 Marks each)

1. The black cutworms are climbing species usually climb stem of trees and eat the plant parts.
2. The cottony cushion scale is a serious pest of cotton.
3. The tomato yellow leaf curl virus transmitted by aphids is the main limiting factor of tomato production in Egypt.
4. Double cotton seeds are formed by the hibernating larvae of the cotton leaf worm.
5. The mole cricket is an example of the leaf chewers.
6. White grubs are pests of tomatoes.
7. The straw berry weevil damage blossoms during sap sucking.
8. The amount of damage done by plant bugs varies with different species owing to the number of the bugs.
9. The alfalfa mosaic viruses are transmitted by white fly.
10. Some insect may feed internally within the plant; this group is called subterranean insects.

B- Fill in the blanks with the appropriate words: (Total 20 Marks, 2 Marks each)

1. ....cause abnormal growths on plants due to inject.................into the plant.
2. The presence of the red palm weevil larvae in palm can be detected by................
3. Common examples of chewing insects that destroy vegetable crops are ....and..............
4. Aphids secret........ which provides excellent medium for the growth of fungus and...... prevent

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- HNO_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- $PbBr_4$

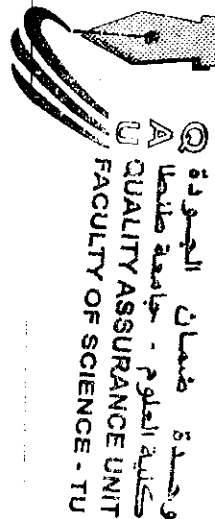## Question (I): State true (√) or false (×) and give the reasons for your answer:

(45 Marks)

1) The acidic medium is the best one for the titration of sodium oxalate by potassium permanganate.

2) The titration of 0.1N sulfurous acid by sodium hydroxide is stepwise.(K_1=1.2x10^{-2}, K_2=5.6x10^{-8})

3) EDTA can be called chelating agent.

4) The normal hydrogen electrode contains titanium sheet.

5) SCN^- ions can be determined satisfactory using Mohr's method.

6) The titration of 1 N carbonic acid can be titrated. (K_1=4.2x10^{-7}, K_2=4.8x10^{-11})

7) The pH value in the titration of weak acid against weak base equals 1/2 pK_w+1/2 pK_a+1/2 log C_{salt}

8) It is possible in Volhard's method to complete titration in presence of AgCl.

9) For writing the half cell equation, the reduced form can be written in the left hand.

10) Br^- and I^- ions can be determined by Volhard's method without any titration error.

11) $HCrO_4^-$ or $Cr_2O_7^{--}$ ions can be used to detect the end point for the precipitation titration of Cl^- ions using Mohr's method.

12) Nernest equation can be applied for the half cell reaction, if the solutions concentration equals 1 N.

13) Each of Fe^{3+} and Ca^{2+} can be determined using EDTA titration.

14) Lewis acid can be defined as hydrogen acceptor.

15) Heating is necessary for Al^{3+}-EDTA titration.

Question (II): Choose the correct answer from each of the following and give the reasons:

(15 Marks)

1) Which of these metal ions can be masked using CN^- ions?

   a) Mg^{2+} b) Zn^{2+} c) Ni^{2+}

2) Distinction between a weak acid or strong acid can be made through...........

   a) Phenolphthalein indicators   b) universal indicator   c) methyl orange indicator

3) For Mercurimetric determination of cyanide,

   a) Fe^{3+} b) Hg^{++} c) Hg^+ was used as indicator

4) Hydrogen acts as a reducing agent,..................................

   a) by taking oxygen   b) by giving electrons   c)by taking hydrogen   d)Both A and B

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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.
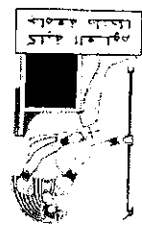
3] A) Explain by equations, what is the action of:
        a- Aqueous KOH   b-Ammonia

On each of the following compounds

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

iii) Ethylchloride   iv) Ethylacetate

Please turn over

COURSE TITLE:	Cell Biology and Genetics		COURSE CODE: ZO 2101
TERM: 1st SEMESTER	DATE OF EXAM: JAN, 2018	ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

First Question: (75 marks)

Q1-a: What is different between four only of the following: 30 marks

1. Apoptosis and necrosis.   2. Atrophy and hypertrophy.
3. Histology and histopathology.   4. Hyperplasia and metaplasia.
4. Contrast and resolution.

Q1-b: Write on two only of the following: 15 marks

1. Causes of cell injury.   2. Importance's of apoptosis.
3. Biochemical and physiological responses to cell signaling.

Q1-C: Identifid only four of the following: 20 marks

1. Infarction   2. Depth of Field   3. Cell
4. Centrifugation   5. Oedema   4. Postmortem change

Q1-D: With full labeled drawing illustrate one only of the following: 10 marks

1) The morphology of apoptosis and necrosis.
2) Cell fractionation to separate the major organelles of the cells.

Second Question: (75 marks)

Q2-A: Explain the following briefly using illustrations when necessary (20 Marks):

1. Explain the differences between studying genetics in Biochemistry, Biophysics and Zoology branche of your specialties.
2. Explain the role of the three types of RNA during the formation of a protein.
3. What happens when the ability to repair damage caused by UV light is deficient in a family.
4. Explain briefly the early mechanisms by which how cells decide to start BER.

Q2-B. True (√) or False (X)   **(if false, write the correct answer) (20 marks):**

1. DNA exists only in nuclei, while RNA exists only in cytoplasm.
2. All DNA in eukaryotic cells comes from both parental and maternal origins.
3. The origin of replication exists at the beginning of each chromosome.
4. Splicing process in DNA repair starts due to activation by the UV light.
5. The mechanism of P-factor depends on hair pin.
6. Initiation of transcription in eukaryotes involves recognition of promoter by transcription factors.
7. Prokaryotic transcripts must not be processed to produce mature mRNAs.
8. The leading strand reading from 5' to 3' is the template strand.
9. Linker histone consists of about 146 bp of DNA wrapped in 1.67 left-handed superhelical turns around the histone octamer.
10. The genetic code is redundant; this means it has multiple codes amounting to the same amino acid.