

# المستوى الثالث

## كيمياء / نبات

المسوى الثالث

للهيات

جوده

Final Examination of Organic chemistry for 3<sup>th</sup> year students

All Double Major  
Hetero Cyclic

Total 100 marks

1-) Answer by equations the following reactions

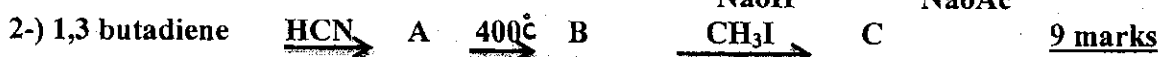
Each item 5 marks

- From phenol how can you prepare benzofuran .
- $\alpha$  - picoline is more acidic than  $\beta$  picoline . Give examples .
- Ring opening of piperidine ring . Show by mechanism .
- Knorr - pyrrole synthesis .
- Pyridine fails to undergo acylation or alkylation ( explain )

2-)

Each item 5 marks (a,b,c,e )

- from Glycerol how can you prepare quinoline
- Trimerization of pyrrole
- how can you prepare 3-nitro furan
- write equations and identify the products A,B,C ( name all the products )



- show the oxidation and reduction of thiophene .

3-)

Each item 5 marks(a,b,c,d)

- From o-nitrotoluene how to prepare Indole
- Draw the resonating structure of pyridine-1-oxide
- synthesis of tryptophan
- convert pyridine to 4-nitropyridine
- Arrange the following compounds according to basisty with explanation : 6marks  
Triethylamine , pyrrole , pyridine and pepridine



Dr. Mohamed Hamed



With by best wishes  
وحدة ضمان الجودة  
كلية العلوم - جامعة طنطا  
QUALITY ASSURANCE UNIT  
FACULTY OF SCIENCE - TU

Prof. Dr. Mahmoud Fahmy

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF BOTANY		
	EXAMINATION FOR (LEVEL THREE) STUDENTS OF CHEMISTRY/BOTANY		
DATE 26 /12	JANUARY, 2018	TOTAL ASSESSMENT MARKS: 150	CODE:BO3101 Time allowed:2 h

**First Group (75 marks)**

Answer the following questions:-


First question: Complete the following. (40 marks, two each)

- 1- Growth rate is measured in terms of ....., ....., .....
- 2- Growth rate increased due to utilization of .....
- 3- Water supply is necessary for growth because .....
- 4- Typical plant consists of ....., ..... and.....
- 5- The growing region of the plant is ..... and.....
- 6- Plant hormones are.....
- 7- Morphogenesis is defined as.....
- 8- Flowering is an important phase because.....
- 9- Photoperiodism is defined as.....
- 10-Vernalization is defined as.....
- 11-Fruit set is defined as.....
- 12-Seed dormancy may be due to .....,..... and.....
- 13-Application of auxin to unpollinated flower lead to.....
- 14-The growing plant is passed through several stages are.....,.....,.....and.....
- 15-Signal perception required.....
- 16-Second messengers include.....,..... and.....
- 17-Signal transduction consists of .....
- 18-Calmodulin is .....
- 19-Flowering of long-day plants require .....
- 20-Phytochrome is.....

Second question: Give brief accounts on three of the following. (35 marks)

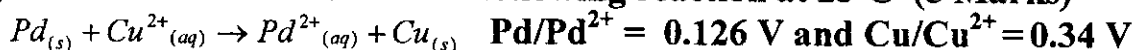
- a- Mention the types of growth and illustrate the initiation of lateral roots.
- b- Illustrate the leaf senescence and its abscission.
- c- Mention the phases occur during the germination of the seeds.
- d- Illustrate the process of vernalization.

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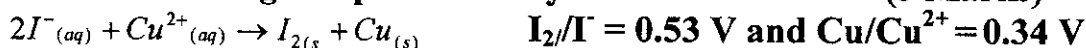
	<b>TANTA UNIVERSITY</b> <b>FACULTY OF SCIENCE</b> <b>DEPARTMENT OF CHEMISTRY</b>			
	<b>EXAMINATION FOR THIRD YEAR-STUDENTS - DUAL SPECIALIZATION</b>			
<b>COURSE TITLE:</b>	electro chemistry		Course code CH345	
<b>DATE: 28 - 12- 2017</b>	<b>DEC, 2018</b>	<b>TERM: FIRST</b>	<b>TOTAL ASSESSMENT MARKS: 50</b>	<b>TIME ALLOWED: 2 HOURS</b>

**Answer the following questions: (50 Marks)**

1. a) Calculate K and  $\Delta G$  for the following reaction at 25<sup>0</sup>C (5 Marks)



b) Does the reaction goes spontaneously (5 Marks)

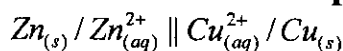


Illustrate your answer.

c) What is the electrode potential of zinc electrode in which the concentration of Zn<sup>2+</sup> ions is 0.01 M ( $E^0_{Zn^{2+}/Zn} = -0.76 \text{ V}$ ) (5 Marks)

2. a) Mention the basic principle of fuel cell and discuss the four types of fuel cells (10 Marks)

3) A galvanic cell can be represented by (10 Marks)



i) Draw a diagram for the cell, Illustrate the direction of flow of current, electron flow and ion flow .

ii) Clarify the sign of the cathode and anode .

iii) Predict the cathode reaction , the anode reaction and the net cell reaction

iv) What is the name of phase boundary represented as || and why it is present

4) Explain the followings with the aids of equations (15 Marks)

i) Lead acid storage battery

ii) metal-ion electrode

iii) Hydrogen electrode.

iv) Concentration cell

v) Nernst equation and its application

**Good luck**

<b>EXAMINERS</b>	<b>PROF. DR. IBRAHIM SHIBL</b>
	<b>PROF. DR. YOUSSEF MOHARRAM</b>



TANTA UNIVERSITY,  
FACULTY OF SCIENCE  
DEPARTMENT OF CHEMISTRY

FINAL EXAM FOR LEVEL 3 DOUBLE MAJOR STUDENTS

COURSE

SURFACE CHEMISTRY AND CATALYSIS

CODE: CH 3143

DATE

DEC 31, 2017

TERM: FIRST

TOTAL ASSESSMENT MARKS: 50

TIME ALLOWED: 2 H

**Please answer these questions**

**Question (1): Choose the correct answer of the followings (10 marks, 1 for each)**


- Which of the following best describes the movement of pollen grains in water?  
a) diffusion b) photosynthesis c) Brownian motion d) distillation
- As the concentration of surfactant increases to the critical micelle concentration, the molecules are collected into a structure called:  
a) ball b) sphere of ions c) micelles d) dirt particle
- Physical adsorption is directly proportional to the  
a) pressure b) temperature c) volume d) concentration
- Foam is a colloidal system in which gas bubbles are dispersed in  
a) gas b) liquid c) solid d) none of these
- The dispersion medium for the formation of fog is a liquid  
a) True b) False
- Which of the following statement is correct regarding chemical adsorption?  
a) it is fast c) it is reversible  
b) it forms multimolecular layers d) it has high heat of adsorption
- The use of membranes for separating impurities from colloidal suspension is  
a) sedimentation b) ultrasonic c) dialysis d) successive cooling
- Among the Langmuir assumptions is an interaction between the adsorbed molecules on the surface  
a) True b) False c) none of these
- Aggregation methods for preparation of colloids involve  
a) Ultrasonic waves b) solvent exchange c) mechanical dispersion d) Bredig's arc method
- Adsorption is the a phenomenon in which a substance  
a) remains close to other substance c) goes into the body of other substance  
b) accumulate on the surface of other substance d) none of these

**Question (2) Mark (✓) or (X) as appropriate (10 marks, 1 for each)**

- The sedimentation rate is affected by medium viscosity.
- The BET adsorption equation includes the parameters  $P^0$  and  $\Delta H_L$ .
- $V_m$  is the volume of gas required for the surface to be fully occupied .
- The CMC of surfactant solution is directly proportional to the chain length .
- The surface coverage ( $\Theta$ ) of a solid catalyst is equal to  $(1+KP) / KP$ .
- The rod-like micelle is formed below the CMC.
- The molar conductivity of surfactant solution increases with the concentration up to CMC.
- The mean displacement of colloidal particles is inversely proportional to the diffusion coefficient.
- The intercept of the relationship  $1/V$  vs  $1/P$  of Langmuir isotherm is  $1/bV_m$
- The tendency for particles to migrate from a region of high concentration to a region of low concentration is controlled by the translation diffusion rate.

باقي الاسئلة في الخلف

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	<b>Tanta University - Faculty of Science</b>		
	<b>Department of Chemistry</b>		
<b>Final Examination for 3<sup>rd</sup> level students in Transition Elements</b>			
Code No.: CH 3147		Major: for all sections	
Term: 1 <sup>st</sup> term 2017/2018	Date: Tuesday, 2/1/2018	Period:	
10-12 AM	Time allowed: 2 hrs.	Total	
assessment: 50 marks			

**I. Complete the following sentences (15 marks)**

- 1- IUPAC organization defined transition elements as those elements that.....
- 2- The size of the d-block elements in a series decreases with increasing the atomic number (from left to right) because of .....
- 3- The atomic volume of Sc group (group IIIB) increases significantly in a regular manner from top to down because of..... but, in Ti group, the volume increases significantly from Ti to Zr, then slightly increases from Zr to Hf because of the lanthanide contraction which is defined as.....
- 4- Oxidation number is defined as ..... For examples the ox. no.'s of the underlined elements in OsO<sub>4</sub> , MnO<sub>4</sub><sup>-</sup> are..... and ....., respectively. In the first series of transition elements, the maximum oxidation number from Sc to Mn is equal to the sum of electrons of ....., but after Mn this number abruptly decreases because of .....
- 6- The colors of the transition metal compounds may arise from:  
(1).....(2).....(3)..... (give examples)


**II. Write down on Two Only of the following: (9 marks)**

- a) Zeigler-Natta catalyst for polymerization of ethylene.
- a) Kroll's method for extraction of titanium and its uses.
- c) Four properties of the lanthanides.

**III. Answer the following:(16 marks)**

- A) In terms of CFT, draw the energy level diagrams of the following ions: a) Fe<sup>3+</sup>(d<sup>5</sup>) in strong and weak octahedral ligand fields. b) Ni<sup>2+</sup>(d<sup>8</sup>) in tetrahedral and square-planar ligand field.

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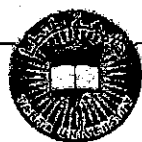
			
<b>Tanta University - Faculty of Science - Botany Department</b>			
<b>Examination for Junior (3rd Year Chem - Bot)</b>			
Course Title	التنوع الحيوى وصون الحياة الفطرية		Course Code: BO 3135
Date	Jan 2018	Term: First	Total Assessment: 50 Marks (BO 4105) Time Allowed: 2 Hr

درجتان ونصف لكل نقطة

- ١- قارن بين الفطرة الأولى والفطرة الثانية؟
- ٢- قارن بين تنوع النقطة وتنوع ألفا؟
- ٣- ماهو اكبر مسبب لانقراض الأنواع؟
- ٤- ماهى مبررات صون التنوع الحيوى؟
- ٥- أيها أفضل: المحميات المفردة كبيرة الحجم أم المحميات العديدة صغيرة الحجم، ولماذا؟
- ٦- وضح كيف أن بعض الأنواع تشارك أكثر من غيرها فى التنوع الحيوى لمنطقة ما؟
- ٧- ما الفرق بين إسترجاع وإعادة تأهيل المجتمعات النباتية؟
- ٨- ماهو التركيز السيادةى النسبى، وكيف يمكن حسابه؟
- ٩- وضح باختصار المقصود بمقياس التصنع كأحد مقاييس الحالة الفطرية للبيئات الطبيعية؟
- ١٠- ماهو المقصود بمراكز التنوع النباتى، وكيف يتم اختيارها طبقا للإتحاد الدولى لصون الطبيعة (IUCN)؟
- ١١- عرف العائد النوعى (تنوع بيتا)؟
- ١٢- ما المقصود بمحمية المحيط الحيوى؟
- ١٣- ما الفرق بين القيمة التعليمية والقيمة العلمية للمحميات الطبيعية؟
- ١٤- ما المقصود بخاصية القابلية للإحلال أو الإيجاد؟
- ١٥- قارن بين خاصية التفرد وخاصية الندرة؟
- ١٦- ماهى ظاهرة الدفينة، وما أهم الأسباب المؤدية إليها؟
- ١٧- ما المقصود بالهشاشة البيئية؟
- ١٨- عرف تنوع الحيوى؟
- ١٩- قارن بين محمية المعزل الطبيعى و محمية الموارد الطبيعية؟
- ٢٠- قارن بين الندرة الطبيعية والندرة المكتسبة؟

مع تمنياتنا لكم بالتوفيق  
لجنة الممتحنين: أ.د. كمال شلتوت & أ.د. أحمد شرف الدين





Course Title:	Physical Organic Chemistry	Course Code: CH3151
Jan. 2018	Term: First	Total Marks: 50 Marks
		Time allowed: 2 Hours

Answer the following questions :

- 1) On the bases of Hammett correlation, illustrate by mechanistic equations the following:
- a- The reaction pathway of m- and p- substituted benzaldehydes with semicarbazide at different  $\rho$ s in ethanol and 25°C. (4 marks)
  - b- Acetolysis of 3-aryl-2-butyl brosylate. (4 marks)
  - c- The (LFER)<sub>s</sub> break down (deviate from correlation) in part of some reactions of p- substituted derivatives. (Two examples) (4 marks)
  - d- The hydrolysis of m- and p- substituted benzoyl chlorides. (4 marks)
- 2) All the following statements are false, please illustrate the correct answer:
- a- The rate of  $S_N^1$  hydrolysis of p- methoxy phenyl dimethyl carbinyl chloride is less than unity. (3 marks)
  - b- The acetolysis of exo - norbornyl brosylate by N.G.P. gives racemic mixture through classical carbocation intermediate. (3 marks)
  - c- In The N.G.P. by both sulphur and nitrogen, the isolated product is secondary alcohol in hydrolysis reactions. (3 marks)
  - d- The reaction of m- and p- substituted styrene with  $Br_2$  in  $CCL_4$  is  $S_N^1$  and  $\rho$  (+ve & -ve) values. (3 marks)
- 3) a- Write a brief summary on Hammett equation. (5 marks)
- b- Calculate the rate of saponification of both m-methyl ethylbenzoate and m-methoxy ethylbenzoate (Given that  $\rho=2.54$ ,  $\sigma_{m\text{-methyl}} = -0.069$  and  $\sigma_{m\text{-methoxy}} = 0.12$ ), then Comment on your answer. (5 marks)

*Please Turn Ove*



Tanta University - Faculty of Science - Chemistry Department

Final Exam in "Instrumental 2"

For **Third level** students (**Biochemistry + All Double Sections**)

Course Code: **CH 3149**

Total assessment marks: **100**

Date: **15/1/2018**

Time Allowed: **2h**

**Question (1):** (20 mark)

**Compare between the following:**

- A) Column diameters, stationary phase and moving phase in GC and HPLC.
- B) TLC and HPLC chromatography.
- C) Radial and ascending development techniques.
- D) Normal and Reverse phases chromatography.

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**Question (2):** (20 mark)

**Explain the following:**

- A) Applications of ion exchange and gel chromatography in brief.
- B) Using of GC in identification and quantitative of components.

\*\*\*\*\*

**Question (3):** (20 mark)

**Write on (two only) the following:**

- A) Draw schematic diagram with liable its parts of HPLC, then state the advantages and disadvantages of HPLC.
- B) Define "Selectivity factor", of ion exchange resins and explain the factors affecting on it.

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**Question (4): Chose the correct answer:** (2 marks for each)

**1) The basis of chromatography for separating components of a mixture is ..**

- A) The differing movement of particles of different mass in an electric field.
- B) The interaction of the components with both stationary and mobile phases.
- C) The absorption of infrared radiation by the components.
- D) The deflection of charged particles in a magnetic field.

- B. will spend more time dissolved in the mobile phase than attached to the stationary phase.
- C. must have a high molecular mass.
- D. will move at a speed close to that of the solvent

**10) What does the selectivity factor describe?**

- A. The proportional difference in widths of two chromatographic peaks.
- B. The maximum number of different species which a column can separate simultaneously.
- C. The relative separation achieved between two species.
- D. None of the above.

**11) Which is most correct, ion exchange is used to analyse:**

- A. Inorganic ions.
- B. Organic ions.
- C. Metal ions.
- D. Most molecules that form ions.
- E. Cells and proteins and aminoacids.

**12) Which of the following is not true about HPLC?**

- A) There is no need to vaporize the samples,
- B) It requires high pressure for the separation of the species,
- C) It has high sensitivity
- D) It is performed in columns

**13) A new youth drink contains sugar, salt, alcohol and vitamin C. A gas chromatogram could be used to determine the ...**

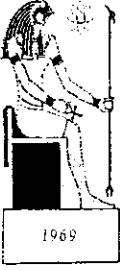

- A. alcohol and sugar content only.
- B. alcohol content only.
- C. alcohol, sugar and vitamin C content only.
- D. concentration of all ingredients in the drink.

**14) An eluotropic series**

- A. Ranks column packing material by their relative abilities to retain solutes on the column,
- B. Is a measure of the solvent adsorption energy,
- C. Ranks solvents by their relative abilities to displace solutes from a given adsorbent,
- D. none of the above

**15) HPLC methods include:**

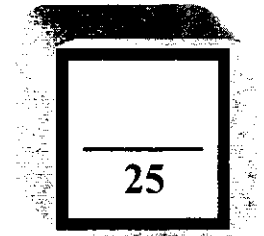
- A. liquid/liquid (partition) chromatography,
- C. ion exchange and size exclusion chromatography,
- B. liquid/solid (adsorption) chromatography,
- D. all of the above.

	<b>TANTA UNIVERSITY</b> <b>FACULTY OF SCIENCE</b> <b>DEPARTMENT OF BOTANY</b>				
	<b>EXAMINATION FOR PHOTOSYNTHESIS (THIRD LEVEL) STUDENTS OF</b> <b>CHEMISTRY AND BOTANY</b>				
	<b>COURSE TITLE:</b>	<b>Plant Photosynthesis</b>		<b>COURSE CODE:</b> <b>BO 3131</b>	
<b>DATE:</b>	<b>2017</b>	<b>TERM: x</b> <b>Sum</b>	<b>TOTAL ASSESSMENT</b> <b>MARKS : 100</b>	<b>TIME ALLOWED</b> <b>2 HOURS</b>	

**Answer the following questions:**

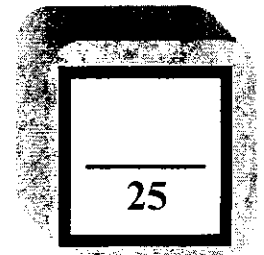
**1- Write short note of the following:**

- a- Enhancement effect
- b- Hill reaction.
- c- Role of carotenoid in photosynthesis
- d- The CO<sub>2</sub> acceptor in Calvin cycle
- e- d- Hatch-Slack pathway



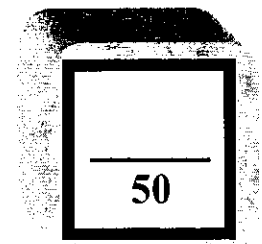
**2- Compare between the following:**

- a- The main differences between Chl. a and chl. b
- b- C<sub>3</sub> plants and C<sub>4</sub> plants and CAM plants



**3- Give full accounts of the following (Illustrated with Drawing):**

- a- Cyclic & non-cyclic photophosphorylation.
- b- The reactions of Photorespiration
- c- Energy transfer in photosynthesis..
- d- Reaction of regeneration phase in carbon reduction cycle.
- e- Blackman theory (Limiting factors theory)



WITH MY BEST WISHES

