وحدة ضمان الجودة
كلية العلوم - جامعة طنطا
QUALITY ASSURANCE UNIT
FACULTY OF SCIENCE - TU

قسم الكيمياء

فصل دراسي ثاني

جميع الشعب الزوجية

Tanta University Faculty of Science Chemistry Department	Coordination chemistry		
	Second Term	Course code: CH 3246	
	Jun -2016	Total Assessment Marks:50	
Double major third year section		Time allowed: 2 Hours	Date : 7/6/2016

Answer the following questions:-

1- A) For the following complexes (15 marks)

i. Bromo tetra amine chromium(III) sulphate.
ii. Nitro tetra aquo iron(III) ion.
iii. Hexamine chromium(III) hexa cyno cobaltate(III).

What are: a) Formula b) Isomer c) type of Isomerism

B) Write Structure formula or name for each complex :

i. $[Pt(NH_3)_4]Br_2$ ii. $Na_2[CuCl_4]$ iii. $[Cr(en)_3][Co(OH)_6]$
iv. trihydroxoaquoferrate(II)ion v. hexamine cobalt(III)chloride
vi. potassium tetraflorocoperate(II).

2- A) For the two complexes $Na_3[Co(CN)_6]$ and $[Co(H_2O)_4]SO_4$ (13 marks)

illustrate:
i. The name of each complex.
ii. The type of Hybridization
iii. The value of CFSE
iv. The magnetic properties and magnetic moment value. (Co = 27)

B) Derive the relation between stepwise and over all formation constant.

3- A) Discuss the splitting of d^4, d^5 and d^7 of octahedral complex (12 marks)
in weak and strong field.

B) Calculate EAN of the following complexes:

$[Cu(CN)(OH)(NH_3)_2]$ and $[Pt(en)_3]Br_4$ (Cu = 29 and Pt = 78)

C) The magnetic moment of potasium tetra bromo manganate (II) is 5.9 BM. Define the Hybrdization of the complex. (Mn=25).

4- A) Discuss factors affecting the Δ_o with examples. (10 marks)

B) Nickel (II) ion forms diamagnetic complex ion with cyano ligands. Derive the formula, the geometry and type of hybridization of the complex. (Ni = 28)

Examiners

Dr. Ekhlas Abd- Elhay Dr. Nadia El-wakiel

امتحان الكيمياء الكهربية ٢٠١٦ جميع الشعب المزدوجة

Tanta University	2^{nd} term Exam: June 2016
Faculty of Science	Subject: Electrochemistry
Chemistry Department	3^{rd} Year Students: (All Double Course)
Time allowed: Two hrs. Total Marks: 100	Course Code: CH3242

Answer The Following Questions (20 Marks for each question)

1. Write short notes on:-

i. Nature of electrode reaction. ii. Modes of mass transport iii. Double layer structure

2. i. For the reaction :

$$Ni^{2+} + 2e^- \rightleftharpoons Ni$$

Calculate the ratio between the surface and bulk concentration of Ni^{2+} when the cathodic current is 5μA and the limiting cathodic current is 10 μA. Calculate also the bulk concentration of Ni^{2+} when m_o is 10^{-3} cm.s^{-1} and the cathode area is 10^{-3} cm^2.

ii. Write down the Ilkovic equation and its application.

3.i. Give examples of coupled chemical reactions and draw their cyclic voltammograms.

ii. Write down the Butler Volmer & Tafel equations and define their terms.

4.i. Calculate the exchange current density using the Tafel equation via the following : current density is 10^{-4} μA.cm^{-2}, α_A =0.5 and the overpotential is 0.2 V vs. NHE for the reaction:

$$Fe^{2+} \rightleftharpoons Fe^{3+} + \bar{e}$$ (Given that, T = 298 K, R = 8.314 JK^{-1}mol^{-1} , F = 96500 C).

ii. Mention the different types of corrosion processes and what are the factors affecting corrosion.

5. i. Compare the diaganostic tests of reversible (fast) and irreversible (slow) cyclic voltammograms.

ii. Define the following giving the units of measurements:

Half – wave potential, Diffusion current, Overpotential, Peak current, Corrosion rate, Peak separation.

GOOD LUCK

Examiners: Prof. Dr. M. A. El-Morsi Prof. Dr. I.S. El-Hallag

Tanta University Faculty of Science Chemistry Department	Coordination chemistry		
	Second Term	Course code: CH 3246	
	Jun -2016	Total Assessment Marks:50	
Double major third year section		Time allowed: 2 Hours	Date : 7/6/2016

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iii. Hexamine chromium(III) hexa cyno cobaltate(III).

What are: a) Formula b) Isomer c) type of Isomerism

B) Write Structure formula or name for each complex :

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2- A) For the two complexes $Na_3[Co(CN)_6]$ **and** $[Co(H_2O)_4]SO_4$ **(13 marks)**

illustrate:
i. The name of each complex.
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iv. The magnetic properties and magnetic moment value. (Co = 27)

B) Derive the relation between stepwise and over all formation constant.

3- A) Discuss the splitting of d^4, d^5 and d^7 of octahedral complex in weak and strong field. **(12 marks)**

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$[Cu(CN)(OH)(NH_3)_2]$ and $[Pt(en)_3]Br_4$ (Cu = 29 and Pt = 78)

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Examiners

Dr. Ekhlas Abd- Elhay **Dr. Nadia El-wakiel**

Tanta University
Faculty of science
Chemistry Dept.

Final Exam. Of Instrumental Analysis (III) CH3252 For special Biochem. Students (level 3).

Answer the following questions:

1-(i) Define the following : Capacitance of an electrode – Modes of mass transport
(ii) Give two examples of ion-selective electrodes.

(20 marks)

2- Compare the techniques of DC-Polarography, pulse and the differential pulse polarography in the current-potential polarogram and the samples detection limit.

(20 marks)

3- What are the main differences between linear sweep and stripping voltammetry.

(20 marks)

4- Sketch the following titration curves:
(i) Amperometric titration curves of Ba^{+2} *(sample) vs.* SO_4^{-2} *(reagent)*
Ni^{+2} *(sample) vs. DMG (reagent)*

(ii) Conductometric titration curves of S-acid + S-base and W-acid + w-base.

(20 marks)

5- What are the main features of :
(i) Electrogravimetry.
(ii) Electrolytic separation.
(iii) Coulometry.

(20 marks)

Best Wishes
Prof. Dr. Mohamed Abd Elmottleb

	Tanta University Faculty of Science Chemistry Department		
	Final Examination of Organic spectroscopy for level three		
	Course Title: Organic Spectroscopy		Course Code: 3214
	Date: June 2016	Total Assessment Marks:150	Time Allowed: 2 hrs

I) Answer the following questions:

a-The compound 2-butanal shows two types of electronic transitions, explain the shift occurred when measured on n-hexane and ethyl alcohol, and what about the molar extraction coefficient in every case.

b- Naphthalene when reduced with Na/alcohol gives two products how could be distinguishe by U.V spectroscopy.

c-Arrange the following sets of double bonds in order of decreasing stretching frequencies:

i-$(CH_3)_2C=CH_2$ ii-$(CH_3)_2C=CCl_2$ iii-$(CH_3)_2C=Br_2$

iv-$(CH_3)_2C=CHF$ iv- $(CH_3)_2C=CF_2$.

d-In cycloalkanones, the stretching frequency for carbonyl group of υ C=O increases with:

(i) Increase in size of the ring (ii) Decrease in size of the ring.

(iii)Decrease in bond angle. (iv) None of these.

Give reasons for your answer.

II) Answer the following questions:

a-Explain by ^1H nmr and mass spectroscopy how to distinguish between the isomer of $C_4H_{10}O$.

b-Phenol and benzyl alcohol.

P.T.O →

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	Examination for Third year students of biochemistry			
	COURSE TITLE:	Biological Separation		
DATE: 31 - 5 - 2016	CORSE CODE	BC 3212	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

I- Explain the principle and applications of each of the following techniques: (20 marks)

1. FISH technique
2. Agarose gel electrophoresis
3. Western blotting
4. Time-lapse imaging

II- Describe the correct biological method for each of the following cases: (30 marks)

1. A method to divide heterogeneous population of cells into individual populations with varying size, shape and complexity.

2. A fluorescence-based method that allow the observation of protein–protein interactions in vivo.

3. A method to quantify the Schistosoma antibody in patients' serum.

أطيب التمنيات بالنجاح و التوفيق

Dr. Mohammed Ahmed Mansour

	TANTA UNIVERSITY *FACULTY OF SCIENCE* *DEPARTMENT OF CHEMISTRY*			
	Examination for Third year students of Chemistry/Biochemistry and Biochemistry			
	COURSE TITLE:	**Body fluids and Biological function**		
DATE: 23 - 6 - 2016	CORSE CODE	**BC 3204**	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

I- Explain each of the following biological processes: (20 marks)

1) Production and reabsorption of the CSF
2) Role of the kidney in the acid-base balance of the blood

II- Compare between each of the following: (30 marks)

1) The four fractions of the semen
2) Prerenal proteinuria vs. postrenal proteinuria
3) Diabetes insipidus vs. diabetes mellitus vs. gestational diabetes

III- Answer the following questions regarding clinical situations: (10 marks)

1) Abnormal results of a semen analysis are volume 1.0 mL and sperm concentration 1 million per milliliter. Explain a nonpathologic cause of these abnormal results.
2) A patient suffering from gallstones has been admitted to the laboratory with pale stool. Explain the possible cause of this abnormal color of the stool.

(See questions on the back)

IV- Discuss the following questions: - (40 marks)

1. Occult Blood Test, and analysis of fecal enzymes.
2. Hemostasis involves vascular spasm, platelet plug formation and clotting, explains.
3. Show by diagram the production of blood cells from pluripotential stem cells.
4. Functions of the smooth articular cartilage, synoviocytes and synovial fluid.
5. Pathologic causes of serous fluids effusions.
6. Laboratory and biological significance in joint disorders.
7. Diarrhea and Steatorrhea.

أطيب التمنيات بالنجاح و التوفيق

Dr. Kareem Samy

Dr. Mohammed Mansour

Tanta University	Faculty of science	Department of chemistry
Examination for level three students (semester 2) of chemistry		
Course title: Molecular spectroscopy	Course code: CH3203	
Date: 23th June 2016	Total assessment marks: 100	Time allowed: 2h

Answer the Following questions **(Each question 25 marks)**

1- (a) Explain the anharmonic oscillation and selection rule of diatomic molecule.

(b) Explain the exchange phenomena in NMR spectroscopy.

2- (a) Drive the equations of energy in Joules and wavenumber in cm^{-1} of rotating rigid diatomic molecule.

(b) Mark (/) or (x) for the following and explain why:

(i) SO_2 is infrared and Raman inactive

(ii) NH_3 is infrared and Raman inactive

(ii) Cl_2 is infrared inactive

3- (a) Write down on the applications of electronic spectroscopy.

(b) Deduce the structure of N_2O from infrared and Raman spectra.

4- (a) Explain by equations the interaction between spin and a magnetic field in the case of NMR and esr spectroscopy.

(b) Choose the correct answer of the following:

(i) The coupling between A_3X_2 system in NMR spectrum give

(a) one doublet and two singlets

(b) triplet of quartet peaks

بقيه الاسئله فى خلف الورقة

(c) two singlet peaks

(ii) The fine structure of esr absorption is due to

(a) the presence of one unpaired electrons

(b) the presence of more than one unpaired electrons

(c) the presence of coupling of the unpaired electron with neighbouring nuclear spins.

Good luck, prof. Dr. Safaa Eldin H. Etaiw

	TANTA UNIVERSITY *FACULTY OF SCIENCE* *DEPARTMENT OF CHEMISTRY*			
	Examination for Third year students of Chemistry/Biochemistry and Biochemistry			
	COURSE TITLE:	**Body fluids and Biological function**		
DATE: 23 - 6 - 2016	CORSE CODE	**BC 3204**	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

I- Explain each of the following biological processes: (20 marks)

1) Production and reabsorption of the CSF
2) Role of the kidney in the acid-base balance of the blood

II- Compare between each of the following: (30 marks)

1) The four fractions of the semen
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(See questions on the back)

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أطيب التمنيات بالنجاح و التوفيق

Dr. Kareem Samy

Dr. Mohammed Mansour

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	Examination for Third year students of biochemistry			
	COURSE TITLE:	**Enzymes (1)**		COURSE CODE: BC3202
DATE:	19 – 6 – 2016	TERM: SECOND TERM	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following questions:-

I. Clarify each of the following questions: (50 Marks)

1. Why do we determine Km.
2. Industrial applications of protease and pectinase enzymes.
3. Iso-enzymes apply to LDH isoenzyme.
4. Describe the overall reaction mechanism and action of Chymotrypsin. (The active site of the enzyme includes histidine 57, Aspartate 102, Serine 195).
5. Polygalacturnase enzyme extracted from A.niger with Mr. 50,000 dalton that is essential for degradation of pectin to galacturonic acid. The enzyme catalyzes the hydrolysis of pectin with Kcat of 2000 S^{-1} at the enzyme concentration 0.04 Calculate the Km of the enzyme when its activity was 0.04 μmole min^{-1} at pectin concentration 0.1 mg.

II. Give an account for the following: (50 Marks)

1. Differences between competitive and uncompetitive inhibitors, explaining their kinetics and Lineweaver-Burk plot relationships.
2. Allosteric regulation, and show their kinetics and R/T states.
3. Difference between ordered and ping pong reaction, give an experiment.
4. Formation of blood clots during zymogen activations.
5. Maltate dehydrogenase catalyze the reaction:

$$\text{Maltate} + NAD^+ \longleftrightarrow \text{oxaloacetate} + NADHH+$$

Inhibition studies shown that NADHH+ was found to be a competitive inhibitor with respect to NAD^+ and oxaloacetate was uncompetitive with respect to NAD^+ as was Malate with respect to $NADHH^+$ at high concentration of fixed substrates. Give a mechanism with these observation and plot of 1/Vo vs 1/ Malate at different fixed concentration of NAD^+.

(باقي الأسئلة خلف الورقة)

III. Discuss the following **(50 Marks)**

1. Suggested mechanism for glucose tautomerization.
2. Compare between random and ordered displacement reactions with examples.
3. Elucidate that Michaelis constant equal substrate concentration when initial velocity becomes half maximum velocity.
4. Role of enzymes in DNA technology and genetic engineering techniques.
5. The velocity of reaction in presence creatine kinase

$$\text{Creatine} + \text{ATP} \longrightarrow \text{Creatine phosphate} + \text{ADP}$$

At 40 °C is fourth greater as the velocity at 20 °C. Calculate the activation energy of this enzyme. Compare between activation energy in presence and in absence of enzymes.

Best Wishes

Prof. Dr. Tarek Mostafa
Dr. Karim Samy

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR JUNIOR (THIRD YEAR) STUDENTS OF CHEMISTRY/BIOCHEMISTRY			
	COURSE TITLE:	HORMONES		COURSE CODE: BC3206
DATE:	16.06.2016	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer all the questions

I. Compare between each of the following *(20 marks)*

a. Trophic hormone and synergism.
b. Paracrine and endocrine cell signaling.
c. Negative and positive feedback inhibition.
d. Goiters and Grave's disease.
e. Hypothalamic and nephrogenic diabetes insipidus.

II. Complete the sentences: *(10 marks)*

1. ..... is a protein hormone of about 191 amino acids that is synthesized and secreted by cells called somatotrophs in the anterior pituitary.
2. The major role of growth hormone in stimulating body growth is to stimulate the liver and other tissues to secrete ..... which stimulates proliferation of chondrocytes resulting in bone growth.
3. Cyclic GMP is synthesized from the nucleotide GTP using the enzyme.....
4. The major Ca^{+2}-binding protein involved in the action of hormone is.....
5. ..... is a chemical acting inside the cell through intracellular receptor such as steroids.
6. .....are proteins inserted into the plasma membrane bilayer of cells and also permeable to small molecules like glycerol and urea.
7. The hormone that stimulates the contractions of smooth muscle in the uterus is .....
8. .....is a hormone that functions to reduce blood calcium levels.
9. The most important variable regulating antidiuretic hormone secretion is.....
10. ..... production is inversely proportional to that of serotonin, a chemical that constricts the blood vessels and acts as a neurotransmitter.

III. Give an account of the following *(20 marks)*

1. Metabolic effects of growth hormones
2. Aquaporines
3. Hashimoto's thyroiditis
4. Melatonin receptors

IV. **Correct the following statements by replacing the underlined word/words** *(10 marks)*

1. A common intermediate in the synthesis of all the steroid hormones is **17α-hydroxypregnenolone**.
2. The major regulator of aldosterone secretion is **ACTH**.
3. Responses to epinephrine initiated by α1-adrenergic receptors are mediated by the **activation of adenylate cyclase.**
4. The chief metabolite of catecholamines is **3-methoxy-4-hydroxyphenylglycol**.
5. Deficiency of steroidogenic enzyme 21-hydroxylase leads to **Addison's disease.**
6. Excessive production of **epinephrine** is noted in Cushing's syndrome.
7. **Methemoglobin** measures average blood glucose for the past 2 to 3 months.
8. Tyrosine kinase activity is present in **β-adrenergic receptors.**
9. **Glycogenesis** is stimulated by glucagon.
10. Individuals with type I diabetes **produce enough insulin but lack functional receptors on their cells**.

V. **Describe how** *(20 marks)*

1. The synthesis and release of catecholamines are regulated
2. Adrenal cortex and adrenal medulla together provide an effective " one–two punch" in response to stress
3. Blood glucose concentration controls insulin release
4. The effects of glucagon action on glycogen metabolism

VI. **Choose the correct answer** *(20 marks)*

1. **Which of the following statements regarding the adrenal gland are correct? (Please select all that apply)**
   a. Chromaffin cells are found in the adrenal medulla
   b. Excess secretion of catecholamines will lead to hypertension
   c. The heart rate is reduced by circulating adrenaline and noradrenaline
   d. Increased catecholamines secretion decreases digestive system activity
2. **A 45-year-old man with history of high blood pressure that has been difficult to control with variety of antihypertensive medications presents with persistent headaches, excessive sweating, and palpitations (noticeably rapid, strong, or irregular heartbeats). What is this patient's most likely diagnosis?**
   a. Pheochromocytoma
   b. Primary hyperaldosteronism
   c. Cushing's disease
   d. Hyperthyroidism
3. **Which of the following is/are functions of cortisol?**
   a. Stimulation of gluconeogenesis
   b. Suppresses immune function
   c. Increases blood glucose levels
   d. a, b, and c

4. **Which of the following hormones inhibits protein synthesis while stimulating protein breakdown?**
   a. Insulin
   b. Glucagon
   c. Epinephrine
   d. Cortisol
5. **Which of the following statements is correct concerning the renin/angiotensin/aldosterone system?**
   a. Cells in the kidney release renin when either blood pressure or blood sodium levels drop
   b. Aldosterone causes the kidney to increase excretion of sodium and indirectly causes a decrease in blood volume
   c. Angiotensin II inhibits the release of aldosterone
   d. Renin directly stimulates the release of aldosterone
6. **What is Addison's disease?**
   a. Addison's disease involves the underproduction of cortisol and aldosterone by the adrenal cortex
   b. Addison's disease involves the underproduction of androgens by the adrenal medulla
   c. Addison's disease involves the overproduction of cortisol and aldosterone by the adrenal cortex
   d. Addison's disease involves the overproduction of androgens by the adrenal medulla
7. **Which of the following statements correctly describes the pathophysiology of Cushing's disease?**
   a. Cushing's disease results from a benign pituitary adenoma secreting excess levels of cortisol
   b. Cushing's disease results from a benign pituitary adenoma secreting excess levels of ACTH High levels of ACTH in turn caused increased release of cortisol from the adrenal cortex
   c. Cushing's disease results from a benign adrenal adenoma secreting excess levels of cortisol
   d. Cushing's disease results from a benign adrenal adenoma secreting excess levels of ACTH High levels of ACTH in turn caused increased release of Cortisol from the Adrenal Cortex
8. **Epinephrine is derived from norepinephrine by**
   a. Decarboxylation
   b. Hydroxylation
   c. Oxidation
   d. N-methylation
9. **The primary target cells for glucagon are**
   a. Skeletal muscle myocytes
   b. Hepatocytes
   c. Pancreatic cells
   d. Nephrons

10. **Which of the following statements best describes the mechanism of action of Sulfonylureas?**
    a. Stimulate the transcription of genes encoding insulin dependent enzymes that lead to better use of glucose by the cells
    b. Increase insulin sensitivity, allowing endogenous insulin to better do its job. The drugs decrease hepatic gluconeogenesis whilst increasing muscle glucose uptake
    c. They work by binding to pancreatic beta cells & causing increased release of insulin
    d. None of the above

GOOD LUCK

EXAMINERS	**Prof. Dr/ Ehab M. Ali** **Dr/ Mai El-keiy** **Dr/ Rasha H. Abu-Khudir**

لـه جزاء

4-Discuss the role of forensic entomology in investigation of contraband trafficking and in war crimes. (15 mark)

Section (3)

Read the following Case history involving forensic entomology then answer the following questions: (30 mark)

A ferry skipper had been condemned to life imprisonment for the murder of a postmaster, whose knifed body had been found one evening in September on the ferry. The ferry skipper had arrived at 1800 on that day, and the body of the murdered postmaster had been found some hours later. The autopsy was performed the next day at 1600. Masses of yellowish fly eggs and numerous newly hatched larvae of 1 to 2 mm in length was present, and the finding was recorded in the autopsy report. No attention was paid to this observation at the trial, however. On assumed evidence, the ferry skipper was condemned to life imprisonment in spite of his swearing that he was innocent. Eight years later the case was reopened. At the new trial, Dr. Mihalyi pointed out that no sarcophagous flies are active in Hungary after 1800 in the month of September. He also recalled some of his experiments indicating that, at a temperature of 26 degrees Celsius, the yellowish eggs of *Luciliacaesar*(L.) hatch after 13 hours, those of *L. sericata*hatch after 10-11 hours, and those of *Phormiaterranovae*14-16 hours after oviposition. These data, applied to the case of the ferry skipper, led to the conclusion that it was not possible that the eggs could have hatched if they had been laid during the day the autopsy was performed, and that they must have been laid during the previous day *before* 1800 since the flies are not active after this time. Dr. Mihalyi's data on oviposition was verified and, on the basis of this and other evidence, the ferry skipper was released from prison.

1. What is the meaning of Autopsy? **(3 mark)**
2. Mention the insects that have been identified in this case and mention its classes? **(5 mark)**
3. Discuss the role of metrological data in this case? **(5 mark)**
4. Do you think that insects played the primary role in the releasing of the ferry skipper from the prison? **(5 mark)**

5. If you are the forensic entomologist in this case or other cases, what are the measures /information that should be taken in consideration when you start your investigation? **(5 mark)**
6. Briefly discuss the stages of decomposition in vertebrate animals? **(7 mark)**

Good luck.

Examiner: Prof.Dr. ElsaiedNaiem, Dr. Hana Elbrens,
Dr.YahaElnaggar

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR JUNIOR (THIRD YEAR) STUDENTS OF BIOCHEMISTRY			
	COURSE TITLE:	HORMONES		COURSE CODE: BC3206
DATE:	16.06.2016	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer all the questions

I. Compare between each of the following *(20 marks)*

a. Trophic hormone and synergism.
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II. Complete the sentences: *(10 marks)*

1. ..... is a protein hormone of about 191 amino acids that is synthesized and secreted by cells called somatotrophs in the anterior pituitary.
2. The major role of growth hormone in stimulating body growth is to stimulate the liver and other tissues to secrete ..... which stimulates proliferation of chondrocytes resulting in bone growth.
3. Cyclic GMP is synthesized from the nucleotide GTP using the enzyme.....
4. The major Ca^{+2}-binding protein involved in the action of hormone is.....
5. ..... is a chemical acting inside the cell through intracellular receptor such as steroids.
6. .....are proteins inserted into the plasma membrane bilayer of cells and also permeable to small molecules like glycerol and urea.
7. The hormone that stimulates the contractions of smooth muscle in the uterus is .....
8. .....is a hormone that functions to reduce blood calcium levels.
9. The most important variable regulating antidiuretic hormone secretion is.....
10. ..... production is inversely proportional to that of serotonin, a chemical that constricts the blood vessels and acts as a neurotransmitter.

III. Give an account of the following *(20 marks)*

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   a. Pheochromocytoma
   b. Primary hyperaldosteronism
   c. Cushing's disease
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   a. Stimulation of gluconeogenesis
   b. Suppresses immune function
   c. Increases blood glucose levels
   d. a, b, and c

4. **Which of the following hormones inhibits protein synthesis while stimulating protein breakdown?**
   a. Insulin
   b. Glucagon
   c. Epinephrine
   d. Cortisol
5. **Which of the following statements is correct concerning the renin/angiotensin/aldosterone system?**
   a. Cells in the kidney release renin when either blood pressure or blood sodium levels drop
   b. Aldosterone causes the kidney to increase excretion of sodium and indirectly causes a decrease in blood volume
   c. Angiotensin II inhibits the release of aldosterone
   d. Renin directly stimulates the release of aldosterone
6. **What is Addison's disease?**
   a. Addison's disease involves the underproduction of cortisol and aldosterone by the adrenal cortex
   b. Addison's disease involves the underproduction of androgens by the adrenal medulla
   c. Addison's disease involves the overproduction of cortisol and aldosterone by the adrenal cortex
   d. Addison's disease involves the overproduction of androgens by the adrenal medulla
7. **Which of the following statements correctly describes the pathophysiology of Cushing's disease?**
   a. Cushing's disease results from a benign pituitary adenoma secreting excess levels of cortisol
   b. Cushing's disease results from a benign pituitary adenoma secreting excess levels of ACTH High levels of ACTH in turn caused increased release of cortisol from the adrenal cortex
   c. Cushing's disease results from a benign adrenal adenoma secreting excess levels of cortisol
   d. Cushing's disease results from a benign adrenal adenoma secreting excess levels of ACTH High levels of ACTH in turn caused increased release of Cortisol from the Adrenal Cortex
8. **Epinephrine is derived from norepinephrine by**
   a. Decarboxylation
   b. Hydroxylation
   c. Oxidation
   d. N-methylation
9. **The primary target cells for glucagon are**
   a. Skeletal muscle myocytes
   b. Hepatocytes
   c. Pancreatic cells
   d. Nephrons

10. **Which of the following statements best describes the mechanism of action of Sulfonylureas?**
    a. Stimulate the transcription of genes encoding insulin dependent enzymes that lead to better use of glucose by the cells
    b. Increase insulin sensitivity, allowing endogenous insulin to better do its job. The drugs decrease hepatic gluconeogenesis whilst increasing muscle glucose uptake
    c. They work by binding to pancreatic beta cells & causing increased release of insulin
    d. None of the above

GOOD LUCK

EXAMINERS	Prof. Dr/ Ehab M. Ali Dr/ Mai El-keiy Dr/ Rasha H. Abu-Khudir

علوم دور ١

1969	Tanta University Faculty of Science Department of Chemistry			
	Final exam. for Juniors students of doubled branches			
	Course title:	Molecular Photochemistry		Course Code: CH3107
Date:	June 2, 2016	Term: second	Total assessment Marks: 50	Time allowed: 2 H

Answer the following questions

1) Write down the following statements. Show whether each of the following statements is true or false, if false, please, write down the true: (20 Marks)

a. Photochemistry is a science which concerns the study of physical and chemical changes which occur in molecules as a result of absorbing radiation in the range between 1200 - 800 nm.

b. Promotion of an electron to an antibonding molecular orbital upon excitation takes about (10^{-10}–10^{-12} s), which is very quick compared to the characteristic time for molecular vibrations (10^{-15} s).

c. 1 Einstein absorbed energy is generally corresponds to one photon absorbed by the system.

d. The efficiency of Förster energy transfer process is dependent upon whether the decay process $D^* \rightarrow D$ and the excitation process $A \rightarrow A^*$ represent allowed or forbidden electronic transitions.

e. The efficiency of the $S_1 \rightarrow S_1$ or $T_1 \rightarrow T_1$ energy transfer depends on the relative energies of the states involved in the transfer step.

f. **In Jablonski Diagram, the triplet state(↑↓) is always of lower energy than the energy of the corresponding singlet state(↑↑) .**

g. In Jablonski diagram, radiative transitions are represented as wavy arrows, while radiationless transitions are shown as straight arrows.

h. Vibrational relaxation of excited state electrons to the lowest energy level is much faster than the electronic transitions and can be measured in femto-seconds.

i. **Intersystem crossing (ISC) is an iso-energetic radiationless transition between two electronic states of same multiplicity**

j. Observed lifetime is the lifetime of an excited molecule in the absence of radiationless transitions.

2) differentiate between each of the following: (15 Marks)

a- Excimer and exciplex.

b- Natural and observed lifetime.

c- Photophysical deactivation quantum yields of benzophenone and naphthalene in rigid solutions at 77^{O} K.

d- E- and P- Types delayed fluorescence.

e- Effect of heavy atom and temperature on deactivation processing

3) Draw only each of the following (15 marks)

a. Jablonski diagram shows the various processes associated with light absorption and their time scale.

b. El-Sayed's rule

c. Triplet-triplet mechanism of energy transfer action according to the Dexter mechanism.

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e. Photo-oxidation of anthracene in presence of a sensitizer.

Good luck

The examiners : 1. Prof. Dr. Shakir T. Abdel-Halim
2. Dr. Naglaa F. Oraiby

كيمياء حيوية

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جمع الشعب المزدوج

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Good luck

The examiners : 1. Prof. Dr. Shakir T. Abdel-Halim
2. Dr. Naglaa F. Oraiby

	Tanta University Faculty of Science Chemistry Department		
	Final Examination of Organic spectroscopy for level three		
	Course Title: Organic Spectroscopy		Course Code:3248
	Date: May 2016	Total Assessment Marks:100	Time Allowed: 2 hrs

I) Explain the following statements:

a- The mass spectrum of 3-pentanone gives the base peaks at m/e=57, while pentanoic gives the base peaks at m/e=60.

b-The aromatic protons are heavily deshielded than cyclohexane.

c-The stretching frequency of υ C=O in acetyl bromide is higher than υ C=O in methyl acetate.

d-Idetify the electronic transitions and the corresponding bands in the following compounds: cinnamaldehyde, maleic acid and benzamide.

II) Explain the following statements:

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c- The absorption spectrum of propanal in diethyl ether, ethyl alcohol and cyclohexane.

d- Arrange the υ C=O in the following compounds: on ester, acyl halide, amide and acid.

III) Explain the following statements:

a-The mass spectra of iodobenzene, chlorobenzene and bromo benzene are completely different.

b-The ^{1}H nmr of n-propyl formate, and 2-chloro propene.

c-How can you distinguish between 1-butanol,2-butanol and 2-methyl-2-propanol.

d-The U.V and I.R spectra of ethylacetoacetate in diethylether and cyclohexane.

IV) An organic compound has the molecular formula C_8H_8O showed the following spectroscopic data:

U.V λmax 292 ε 16 and λmax 248 ε 8400

I.R: υ at 1722 cm^{-1}(C=O).

^{1}H NMR	The mass data
multiplet (δ 2.73) 5H	M^+=130 72%
doublet (δ 7.2) 2H	m/e=129 84%
triplet (δ 0.22)1H	m/e=91 100%
(All the data in τ values)	m/e=65 49%

Find out the structure of the above compound and explain all the given spectroscopic data.

Prof.Dr. Mohamed. A. El-Borai

,,,,,,,,,,,,,,,,,,,,,,,,,,,, *Good Luck*,,,,,,,,,,,,,,,,

	**Tanta University - Faculty of Science** **Department of Chemistry**
	Final examination for 3rd level students in Transition Elements **Code No.: CH 3280** **Majors: Botany, Microbiology** **Term: 2nd term 2015/2016** **and Zoology** **Date: Thursday, 2/6/2016** **Period: 1-3 PM** **Total assessment: 50 marks**

I. Complete the following sentences **(16 marks)**

1- The atomic volume of the first series of the transition metals with..... increasing the atomic number until near the end of series because of .... **(2 marks)**

2- The atomic volume of Sc group (group IIIB) increases regularly from top to down because of .....but, in Ti group, the volume increases regularly from Ti to Zr, then slightly increases from Zr to Hf because of the lanthanide contraction which is defined .... **(3 marks)**

3- Oxidation number is defined as .....

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 two factors: .... **(4 marks)**

4- The colors of the transition metal compounds may arise from

1- ..... 2- ..... 3- ..... **(3 marks)**

5- Metal cluster compounds are those that contain more than two atoms of the same metal bonded together in a polygonal or polyhedral structures and these compounds occur in elements of .....of the d-block with oxidation states..... Draw the structure of $[Nb_6Cl_{12}]^{2+}$ **(4 marks)**

II. Answer the following: **(12 marks)**

1- Calculate the spin-only magnetic moment (μ_s) and the spin-orbit magnetic moment (μ_{S+L}) for the free Ni^{2+} ion. Which of these values is in agreement with the measured value (μ_{eff}) for Ni^{2+} in $NiSO_4.6H_2O$ (μ_{eff} = 2.91 BM/ Ni atom). Comment on the results.
(Atomic number of Ni = 28). **(4 marks)**

2- Give a reason for each of the following:

i- The complex ion $[Mn(CN)_6]^{4-}$ is deep red in color, while $[Mn(H_2O)_6]^{2+}$ is pale violet. **(4 marks)**

ii- NbF_4 is paramagnetic, while NbI_4 is diamagnetic in the solid state, though in both compounds Nb has a d^1-configuration. **(4 marks)**

III- Complete the following chemical equations: **(14 marks)**

1) $V + F_2 \xrightarrow{\Delta}$

2) $Mn^{2+}_{(aq)} + OH^- \rightarrow \xrightarrow{air}$

3) $NbI_5 \xrightarrow{3000\ ^\circ C}$

4) $La(OH)_3 + NH_4Cl \rightarrow$

5) $Fe_2O_3 + Na_2CO_3 \xrightarrow{Fusion}$

6) $OsO_4 + 2OH^- \rightarrow$

7) $4RuO_4 + 8OH^- \rightarrow$

IV- Write short notes on **Only Two** of the following: **(8 marks)**

1- Kroll's method for extraction of titanium.

2- Penta oxides of vanadium group (V, Nb and Ta)

3- Describe Only Four properties of the lanthanides.

Good Luck

Examiner: Dr. Samir S. Kandil

جميع الشعب المزدوج

1989	Tanta University Faculty of Science Department of Chemistry			
	Final exam. for Juniors students of doubled branches			
	Course title:	Molecular Photochemistry		Course Code: CH3107
Date:	June 2, 2016	Term: second	Total assessment Marks: 50	Time allowed: 2 H

Answer the following questions

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الجزاء

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	Course Title: Organic Spectroscopy		Course Code:3248
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1969	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY		
	FINAL EXAM EXAMINATION THIRD YEAR SPECIAL CHEMISTRY STUDENTS		
	COURSE TITLE: SOLID STATE CHEMISTRY		COURSE CODE: CH3208
DATE: 29TH MAY, 2016	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50	TIME: 2 hours

Answer the following questions (2 marks per sub-question point).

1- (a) In the temperature range 910 °C to 1400°C, iron exists in the austenite face centered cubic (fcc) structure of unit cell dimension a = 3.6 Å. Given the atomic weight of iron as 56 $gmol^{-1}$ and Avogadro's number $N = 6.02 \times 10^{23} mol^{-1}$, calculate each of the following:

(i) The density of this phase of the austenite phase of iron.

(ii)The atomic packing factor (APF).

(b) A gold thin film is deposited on a square piece of mica of area 1 cm^2area. The gold film forms an ideal (100) surface structure. An epitaxial layer of Cu having 100 atomic monolayers is deposited on the Au (100) substrate. Gold has the face centered cubic (fcc) crystallographic structure and its lattice constant equals 4.0×10^{-8} cm and

Avogadro's constant $A = 6.02 \times 10^{23}\ mol^{-1}$).

(c) Apply the Kapustinski Equation;

$$U = -\frac{1069\ \upsilon\ Z^+ Z^-}{r^+ + r^-}\ k\ J\ mol^{-1}$$

to calculate the lattice energy of AgI given $r^+ = 1.3$ A° and $r^- = 2.16$ A°. Do you expect the calculated value will match well with the value calculated from Born – Haber cycle. Justify your answer.

(d) Mention only one application on polymorphism in our everyday life and discuss the scientific background of your choice.

2- In no more than 2 lines, give reasons for each of the following:

(a) The electrical conductivity of metals decreases upon increasing temperature.

(b) ZnS becomes fluorescent upon heating.

(c) Protein emission is dominated by tryptophan moiety

(d) TiO_2 anatase crystal form is a better photocatalyst compared with rutile phase.

3- Write chemical equations describing each of the following:

(a) Scale formation in boilers

(b) Color centers formation upon heating barium azide $Ba(N_3)_2$

(c) Ammonia synthesis using iron as a catalyst

(d) F- centers formation upon subjecting NaCl to UV light.

انظر خلف الصفحة

4- Discuss briefly each of the following:

(a) Polymerized crystalline colloidal arrays (PCCAs) and their application as sensors of metal ions, glucose and biomarkers.

(b) The application of gold nanoparticles in DNA sequencing and gold nanorods in cancer treatment

3- Draw and carefully label each of the following:

a) (111) plane, (111) direction and (110) position.

b) The electronic processes occurring in TiO_2 nanoparticles leading to photocatalytic action.

c) The chemical structure of a natural clay and a zeolite.

d) Different types of liquid crystals and mention which is the most ordered type?

e) The phase diagram of CTAB surfactant.

(f) Molecular packing in different crystal types of cinnamic acids giving rise to different reactivities according to the topochemical postulate.

(g) Energy diagram of p-n junction leading to photovoltaic action.

(h) Types of point defects

End of Exam

EXAMINERS: Prof. Dr. El-Zeiny Mousa Ebeid and Prof. Dr. Sayed Kandil

	Tanta University Faculty of Science Chemistry Department		
	Final Examination of Organic spectroscopy for level three		
	Course Title: Organic Spectroscopy		Course Code:3248
	Date: May 2016	Total Assessment Marks:100	Time Allowed: 2 hrs

I) Explain the following statements:

a- The mass spectrum of 3-pentanone gives the base peaks at m/e=57, while pentanoic gives the base peaks at m/e=60.

b-The aromatic protons are heavily deshielded than cyclohexane.

c-The stretching frequency of υ C=O in acetyl bromide is higher than υ C=O in methyl acetate.

d-Idetify the electronic transitions and the corresponding bands in the following compounds: cinnamaldehyde, maleic acid and benzamide.

II) Explain the following statements:

a- The ^{1}H NMR spectrum of p-methoxy benzaldehyde and p-methyl acetophenone.

b- The mass spectrum of phenyl acetylene and n-propyl benzene.

c- The absorption spectrum of propanal in diethyl ether, ethyl alcohol and cyclohexane.

d- Arrange the υ C=O in the following compounds: on ester, acyl halide, amide and acid.

III) Explain the following statements:

a-The mass spectra of iodobenzene, chlorobenzene and bromo benzene are completely different.

b-The ^{1}H nmr of n-propyl formate, and 2-chloro propene.

c-How can you distinguish between 1-butanol,2-butanol and 2-methyl-2-propanol.

d-The U.V and I.R spectra of ethylacetoacetate in diethylether and cyclohexane.

IV) An organic compound has the molecular formula C_8H_8O showed the following spectroscopic data:

U.V λmax 292 ε 16 and λmax 248 ε 8400

I.R: υ at 1722 cm^{-1}(C=O).

^{1}H NMR	The mass data
multiplet (δ 2.73) 5H	M^+=130 72%
doublet (δ 7.2) 2H	m/e=129 84%
triplet (δ 0.22)1H	m/e=91 100%
(All the data in τ values)	m/e=65 49%

Find out the structure of the above compound and explain all the given spectroscopic data.

Prof.Dr. Mohamed. A. El-Borai

,,,,,,,,,,,,,,,,,,,,,,,,,,,, *Good Luck*,,,,,,,,,,,,,,,,

	TANTA UNIVERSITY FACULTY OF SCIENCE CHEMISTRY DEPARTMENT		
	FINAL EXAM FOR SENIOR STUDENTS (DOUBLE MAJORS)		
	COURSE TITLE:	MOLECULAR SPECTROSCOPY (CH3240)	TIME ALLOWED: 120 MINS
DATE: MAY31, 2016	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50	

Useful constants : h = 6.626 x 10^{-34} J s, c = 3 x 10^{8} ms^{-1}

Answer each of the following (10 Mark for each question)

1-(a) Define each of the following:

(i) Spectroscopy (ii) Inelastic collosion (iii) Elastic Scattering

(b) – (i) Calculate the degeneracy of the rotational energy level with J =4 for heteronuclear diatomic molecule

(ii) If the lifetime of an excited state is 10^{-9} sec, what the uncertainty in its energy

2-(a) State three selection rules for Uv-Vis electronic absorption spectra.

(b) Explain the Franck – Condon principle accounts for intensities of spectral lines in vibrational electronic spectra.

3- (a) State the Raman scattering selection rule and explain the difference between Stokes and anti-Stokes Raman spectra

(b) Calculate the vibrational of a $^{12}C^{16}O$ molecule, given that the force constant of the bond is 1903 N m^{-1}.

4-(a) Explain different types of vibrational exhibited by CO_2 and water molecules in IR spectroscopy. Diagram these modes.

(b) The absorption peak in the IR spectrum of $^{1}H^{35}Cl$ occurs at 2885 Cm^{-1}. Calculate the wavenumber at which you would see the absorption due to $^{1}H^{37}Cl$.

5-(a) Draw the energy level diagram illustrating the lowest five rotational energy levels of rigid diatomic molecule. Lable the diagram so that each energy level is identified by the value of rotation quantum number and the energy.

(b) Calculate the wavelength of radiation required to excite a CO molecule from J = 2 to J =3 rotational level given that the rotational constant of the molecule is 3.819×10^{-23} J

لجنة الممتحنين:الاستاذ الدكتور سامي الدالي الاستاذ الدكتور طارق فايد

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لجنة الممتحنين:الاستاذ الدكتور سامي الدالي الاستاذ الدكتور طارق فايد

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR JUNIORS (LEVEL 3)STUDENTS OF CHEMISTRY SECTION			
	COURSE TITLE:	NATURAL PRODUCTS		COURSE CODE: 3216
DATE: - 2- 6.16	JUNE. 2016	SECOND TERM EXAM	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following questions:

1-A-Explain each of the following:- *(30 marks)*

*i-*Oxidation to lactobionic acid by bromine water followed by methylation and hydrolysis which gave 2,3,,5,6-tetra-O-merhyl-D-gluconic acid and 2,3,4,6-tetra-O-methy –D-galactose

ii- Acidic R groups lower the P^1 for amino acids whereas basic R groups increase the P^1.

(pkas of ASP. α –COOH = 2.1 α- NH2 = 9.8 , side chain = 3.9,
(pkas of Lys. α –COOH = 2.18 α- NH2 = 8.95 , side chain = 10.53

2-A-Give the structural formulas for the following compounds: *(30 marks)*

i-Methylβ-D-xylopyranoside ii- β-anomer of D-Glc(β-1-4)-D-Glc

iii-N-*Acetamido--2-deoxy-β-D-glucose* vi- α,α`-distearo-β-olein *v-phospatidyl choline*

*B-*How do you determine the C-terminus in the pentapeptide Tyr-Gly-Gly-Phe-Val by FDNB

C-Sugesst a method to prepare the dipeptide Gly-Ala, starting from appropriate protected amino acids

3- A : Choose the correct answers and explain by equations *(30 marks)*

i-Which two of the following compounds are reduced to the same optically inactive alditol by sodium borohydride:- a- D-arabinose b-L- Lyxose c-D-Lyxose d-L-Xylose

ii- Amino acids react with Acetaldehyde to form :-

a- decarboxylation products b -decarboxylation and/or deamination products

c- deamination products

B-Draw the structural formulas for the following fatty acids

R1= C 16:0 , R2 = C 18:1 Δ^9 R3 18:2$\Delta^{9,12}$ R4 = C 18:1 w7

4-Discuss each of the following *(30 marks)*

i- i-Compounds containing active (CH_2) group such as diketopiperazine and hydantoin can be used to synthesize phenylalanine

ii-Oxidative protein folding

iii-N-Terminal residue analysis (Edman method) of the pentapeptide Gly.Ala.Val.Tyr.Phe

5-Illustrate in equations each of the following:- *(30 marks)*

i-*Synthesis of mixed tri-glycerides.*

ii- Application of HIO4 oxidation to Sucrose ,then oxidation and hydrolysis

iii- A laboratory synthesis of a uronic acid from an aldose requires protecting the aldehyde and hydroxy groups.

PROF. Dr. AHMED SAAFAN

صيدلي بيولوجي

	**Tanta University - Faculty of Science** **Department of Chemistry**
	Final examination for 3rd level students in Transition Elements **Code No.: CH 3280** **Majors: Botany, Microbiology and Zoology** **Term: 2nd term 2015/2016** **Date: Thursday, 2/6/2016** **Period: 1-3 PM** **Total assessment: 50 marks**

I. Complete the following sentences **(16 marks)**

1- The atomic volume of the first series of the transition metals with..... increasing the atomic number until near the end of series because of .... **(2 marks)**

2- The atomic volume of Sc group (group IIIB) increases regularly from top to down because of .....but, in Ti group, the volume increases regularly from Ti to Zr, then slightly increases from Zr to Hf because of the lanthanide contraction which is defined .... **(3 marks)**

3- Oxidation number is defined as .....

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 two factors: .... **(4 marks)**

4- The colors of the transition metal compounds may arise from

1- ..... 2- ..... 3- ..... **(3 marks)**

5- Metal cluster compounds are those that contain more than two atoms of the same metal bonded together in a polygonal or polyhedral structures and these compounds occur in elements of .....of the d-block with oxidation states..... Draw the structure of $[Nb_6Cl_{12}]^{2+}$ **(4 marks)**

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR THIRD YEAR - STUDENTS OF CHEMISTRY			
	COURSE TITLE:	electro chemistry		COURSE CODE : CH3206
DATE: 16-6-2016	JUN, 2016	TERM: SECOND	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following questions: *30 marks per each question (150 Marks)*

1) Derive the current-potential relationship for electrode reaction (A + e = B) and sketch the i - E curve, where A is only present. (30 Marks)

2) Draw the diagrams of the following (30 Marks)
a) ECE electrode reaction with an example .
b) Reversible cyclic voltammogram and indicates the $E_{1/2}$ on the graph .
c) Two electrode polarographic cell and shows the advantages of DME.

3) a) Show the difference between faradaic and non-faradaic current .
b) Mention the variables affecting the rate of an electrode reaction .
c) Sketch a circuit of two electrode and three-electrode cells. (30 Marks)

4) Derive the relationship between electrode reaction rate and corrosion current (30 Marks)

5) a) Fill in the space on the followings (15 Marks)
1) Cyclic voltammetry involves the measurement of diffusion controlled ..... at an electrode in which the ..... is controlled .
2) Faradiac current in polarography is known as ..... .
3) Polarization resistanse is equal to ..... .
4) Electrolysis rate is equal to ..... .
b) Draw the cyclic voltammogram in which the electrode product is consumed in a coupling chemical reaction (15 Marks)

$A + e \longrightarrow P$

$P \longrightarrow D$

Assume that D is not observed in any further electrochemical reaction .

EXAMINER	PROF, DR. M.M. GHONEIM AND PROF. DR. Y. I. MOHARRAM

1969	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY INORGANIC CHEMISTRY		
	COURSE TITLE:	Coordination Chemistry	COURSE CODE: CH 3210
DATE:	19 JUN , 2016	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following Questions

I) Pt(IV) ion form an ionic octahedral complex (A) containing $5H_2O$ molecules, bromide and sulphate ions. This complex reacts with $AgNO_3$ and give complex (B) and reddish brown precipitate.
   a-What are the formulae and names of complexes A and B
   b-What are the possible isomerism and types of isomer of complex B.

II) a- Cr(II) ion form complex with cyano ligand. The magnetic moment of this complex is 2.82 BM. What is the expected geometry of the complex (Cr= 24).
   b- Discuss the factors affecting the value of Δ_0.

III) For Fe^{2+} the electron pairing energy (P) is 210 KJ/mol. The values of Δ_0 for the complexes $[Fe(H_2O)_6]^{+2}$ and $[Fe(CN)_6]^{-4}$ are 120 and 390 KJ/mol.,respectively.
   a-Calculate the CFSE for the inner complex (Fe=26).
   b-Calculate the EAN for the outer complex.

IV) a- Discuss the factors affecting the stability of metal complexes.
   b- Draw the crystal field splitting of d-orbitals of the central metal cation of tetrahedral and square planar complexes.

V) a- What are the formula of the following complex:

   Tetra amine copper(II) hexa-chloro copperate(II).

   b- Discuss one of the important uses of CFSE values.
   c- Define the ambidentate ligands.

Examiners

Prof. Dr. Mohamed Gaber Abu-Elazm
Prof. Dr. Kamal El-Baradie

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	Examination for Third year students of biochemistry			
	COURSE TITLE:	**Enzymes (1)**		COURSE CODE: BC3202
DATE:	19 – 6 – 2016	TERM: SECOND TERM	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following questions:-

I. Clarify each of the following questions: (50 Marks)

1. Why do we determine Km.
2. Industrial applications of protease and pectinase enzymes.
3. Iso-enzymes apply to LDH isoenzyme.
4. Describe the overall reaction mechanism and action of Chymotrypsin. (The active site of the enzyme includes histidine 57, Aspartate 102, Serine 195).
5. Polygalacturnase enzyme extracted from A.niger with Mr. 50,000 dalton that is essential for degradation of pectin to galacturonic acid. The enzyme catalyzes the hydrolysis of pectin with Kcat of 2000 S^{-1} at the enzyme concentration 0.04 Calculate the Km of the enzyme when its activity was 0.04 μmole min^{-1} at pectin concentration 0.1 mg.

II. Give an account for the following: (50 Marks)

1. Differences between competitive and uncompetitive inhibitors, explaining their kinetics and Lineweaver-Burk plot relationships.
2. Allosteric regulation, and show their kinetics and R/T states.
3. Difference between ordered and ping pong reaction, give an experiment.
4. Formation of blood clots during zymogen activations.
5. Maltate dehydrogenase catalyze the reaction:

$$\text{Maltate} + NAD^+ \longleftrightarrow \text{oxaloacetate} + NADHH+$$

Inhibition studies shown that NADHH+ was found to be a competitive inhibitor with respect to NAD^+ and oxaloacetate was uncompetitive with respect to NAD^+ as was Malate with respect to $NADHH^+$ at high concentration of fixed substrates. Give a mechanism with these observation and plot of 1/Vo vs 1/ Malate at different fixed concentration of NAD^+.

(باقي الأسئلة خلف الورقة)

1969	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY			
	EXAMINATION FOR LEVEL THREE STUDENTS OF CHEMISTERY / ZOOLOGY			
	COURSE TITLE:	Physiology 1		COURSE CODE: ZO3242
DATE:	JUNE, 2016	TERM:SECOND	TOTAL ASSESSMENT MARKS:15 0	TIME ALLOWED: 2 HOURS

Part I..... (75 Points)

Compare between : (25 points)

1. Oxidation of glucose invivo and invitro.
2. Cytochrom and cytochrom oxidase.
3. Action of glucose – 6 – phosphatase and hexokinase in liver.

Explain: (20 points)

The pathway of glycogenolysis .

Give an account on: (30 points)

1. Type two of diabetes mellituse .
2. Factors tending to lower blood glucose .
3. Fate of pyruvate after oxidation of glucose .

Part II..... (75Points)

1.Answer the following questions:

a-Compare between the two enzymes pepsin and renin . (5 points)
b-What are the functions of HCL? (10 points)
c-Describe the propulsive movements. (5 points)
d-Explain the pinocytosis. (10 points)

2. Mention the following..... (15 points)

a- Functions of secretin-lysozyme-erepsin.
b-Filter feeding.

3. Define the following :..... (20 points)

a-Factors affecting enzyme action .
b-Absorption of proteins.

4. Explain the following:..... (10points)

a-Phagocytosis.
b-Ciliary mode of feeding.

EXAMINERS	DR. ZEINAB ATTIA	DR. HALA ABDELAZEEM

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	Examination for Third year students of biochemistry			
	COURSE TITLE:	**Enzymes (1)**		COURSE CODE: BC3202
DATE:	19 – 6 – 2016	TERM: SECOND TERM	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following questions:-

I. Clarify each of the following questions: (50 Marks)

1. Why do we determine Km.
2. Industrial applications of protease and pectinase enzymes.
3. Iso-enzymes apply to LDH isoenzyme.
4. Describe the overall reaction mechanism and action of Chymotrypsin. (The active site of the enzyme includes histidine 57, Aspartate 102, Serine 195).
5. Polygalacturnase enzyme extracted from A.niger with Mr. 50,000 dalton that is essential for degradation of pectin to galacturonic acid. The enzyme catalyzes the hydrolysis of pectin with Kcat of 2000 S^{-1} at the enzyme concentration 0.04 Calculate the Km of the enzyme when its activity was 0.04 μmole min^{-1} at pectin concentration 0.1 mg.

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1. Differences between competitive and uncompetitive inhibitors, explaining their kinetics and Lineweaver-Burk plot relationships.
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Inhibition studies shown that NADHH+ was found to be a competitive inhibitor with respect to NAD^+ and oxaloacetate was uncompetitive with respect to NAD^+ as was Malate with respect to $NADHH^+$ at high concentration of fixed substrates. Give a mechanism with these observation and plot of 1/Vo vs 1/ Malate at different fixed concentration of NAD^+.

(باقي الأسئلة خلف الورقة)