	Tanta University			
	Faculty of Science			
	Department of Chemistry			
	Final exam. for senior students of chemistry			
	Course title:	Physical Chemistry		Course Code: 14041
Date:	Jan. 5, 2013	Term: First	Total assessment Marks: 60	Time allowed: 3 H

Answer all questions of the following three sections

Section A: Molecular Photochemistry (20 marks)

- 1) State whether each of the following statements is true or false, if false, please, write down the true statements. (12 Marks)
 1. The value of Φ_f can be enhanced relative to Φ_p by using solvents containing heavy atoms.
 2. The lifetime τ_f is much shorter (faster) than τ_p and the mechanical rotating cylinder apparatus can be operated rapidly enough to enable fluorescence decay to be recorded.
 3. The term excimer is used to denote an excited state dimeric species.
 4. The rate constants for energy transfer increase as the energy of the donor triplet state falls below that of the acceptor triplet state.
 5. The energy gap, $\Delta E(T_1 \sim S_0)$ is a factor which determines the relative magnitudes of Φ_f and $\Phi_{isc}(S_1 \sim T_1)$.
 6. For reactions involving triplet states it is imperative to degas the system to remove dissolved oxygen.
- 2) Give short notes on four of the following: (8 Marks)
 1. Some solvents such as benzene, acetone and isopropanol could be used as reactant molecules in the photochemical reactions.
 2. Intramolecular energy transfer.
 3. Wigner spin conservation rule.
 4. The rate of decay of T_1 state describes the unimolecular and bimolecular processes.
 5. Coupled transitions in donor and acceptor energy transfer.
 6. Energy transfer between benzophenone and naphthalene.

Section B: Molecular Reaction Dynamics (20 marks)

- 3) A. Put true or false sign and correct the false answer. (5 Marks)

1. In case of activated complex the number of vibrational degree of freedom is $3(N_A + N_B) - 6$ for non-linear molecule.
2. A chemical reaction that absorbs heat from the surroundings is said to be exothermic and has a -ve ΔH .
3. The energy of activation may also be calculated by another form of the Arrhenius equation as follows, $\ln \frac{K_2}{K_1} = \frac{E}{R} \left(\frac{T_2 - T_1}{T_1 T_2} \right)$.
4. The rate constant in terms of collision theory is $K = Ae^{-E/RT}$, where in terms of entropy and activation energy is $K = \nu e^{\Delta S^\ddagger/R} e^{-\Delta H^\ddagger/RT}$.
5. Transition state theory states that molecules must collide with the proper orientation in order to react.

B. Derive the rate constant from transition state theory. (5 Marks)

4) A. Define the following: (4 Marks)

1. Stored energy
2. Saddle point
3. Steric factor
4. Activation energy

B. Calculate the value of frequency factor in $\text{dm}^3 \text{mol}^{-1} \text{s}^{-1}$ for the following reaction (atom + linear \rightarrow linear) assuming that $q_{\text{trans}} = 10^8$, $q_{\text{rot}} = 10$, $q_{\text{vib}} = 1$ and $\frac{k_B T}{h} = 10^{13} \text{s}^{-1}$, Avogadro's constant is taken to be 10^{24}mol^{-1} . (4 Marks)

C. Write only two reasons for the weakness of collision theory. (2 Marks)

EXAMINERS:	1- Prof. Dr. Shakir T. Abdel-Halim
	2- Dr. Eman Fahmy Aboelfetoh

Section C: Molecular spectroscopy. (20 marks)

1. Choose the correct answers: (write your choice only) (6 marks)
 - a- How many normal modes of vibration does methane have?

i- 15	ii- 12
iii- 9	iv- 6

(1 mark)
 - b- The width of a spectral band or line is affected by

i- Band position.	ii- Collision broadening
iii- Population of states	iv- Spacing between the energy levels.

(1 mark)
 - c- Symmetric tops rotor as NH_3 has three moments of inertia I_a , I_b and I_c such that:

i- $I_a = 0, I_b = I_c$.	ii- $I_a = I_b \neq I_c$.
iii- $I_a = 0, I_b \neq I_c$.	iv- $I_a \neq I_b \neq I_c$.

(1 mark)
 - d- For anharmonic oscillator potential energy diagram of diatomic molecule, the transition $v_1 \rightarrow v_2$ is called:

i- First overtone.	ii- Fundamental absorption band
iii- Second overtone -	iv- Hot band

(1 mark)
 - e- For anharmonic oscillator potential energy diagram of diatomic molecule, the transition $v_0 \rightarrow v_2$ is called:

i- First overtone.	ii- Fundamental absorption band.
iii- Second overtone.	iv- Hot band.

(1 mark)
 - f- The relative intensities of rotational spectral lines are function on

i- Boltzmann distribution function $[\exp(-E_J / KT)]$.	ii- Cell length.
iii- Number of fold degeneracy $(2J+1)$.	iv- $(2J+1) \cdot \exp(-E_J / KT)$

(1 mark)
2. Put (\checkmark) at the correct sentence and (X) at the wrong one. (don't write the sentence). (5 marks)
 - a- Frank-Condon principle governs the relative intensities of transitions between vibrational energy levels of different electronic states. (1 mark)
 - b- A progression in absorption electronic spectrum is a series of bands with a common lower vibrational level. (1 mark)
 - c- Polarizability of H_2 molecule changes as the molecule vibrates. (1 mark)
 - d- The population in vibrational energy levels v_1 and v_0 are equals at 300 K. (mark)
 - e- Term symbol is an exact notation used in spectroscopy to define and characterize the energy states of atoms and molecule. (1 mark)
3. Draw an energy diagram to show Raman effect (Raleigh scattering, stokes and anti-stokes Raman). (3marks)
4. Compare between the energy levels and the position of rotational spectra in rigid and non-rigid di-atomic rotor. (3marks)
5. (3marks)

The fundamental and first overtone of $^1\text{H}^{35}\text{Cl}$ observed at 2886 cm^{-1} and 2668 cm^{-1} respectively. Calculate:

 - a- Equilibrium vibration frequency,
 - b- Anharmonicity constant.


EXAMINERS:	Section A: Prof. Dr. Shaker Abd-Elhalem..	Section C: Prof. Dr. Samy Salem Assar.
	Section B: Dr. Eman Fahmy	

Joe III

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR LEVEL FOUR STUDENTS (SEMSTER 1) OF CHEMISTRY/BIOCHEMISTRY, GEOLOGY, MICROBIOLOGY, AND ZOOLOGY			
	COURSE TITLE:	BIO-INORGANIC CHEMISTRY	COURSE CODE: CH4159	
DATE:	1 ST JANUARY, 2014	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOUR

1. **Only by using fully labeled diagram, explain the following (9 marks):**
 - b. The role of Selenium in the mechanism of action of Glutathione peroxidase.
 - c. The pathway of Vanadium accumulation and mechanism of Vanadium reduction.
 - d. Copper homeostasis.

2. **What are siderophores? Mention their types? Give one example for each type? (4 marks)**

3. **List and explain (8 marks):**
 - a. The biological functions of Silicon.
 - b. The treatment of Cyanide toxicity.
 - c. The biochemical basis of Lithium treatment of psychiatric disorders.
 - d. The symptoms of Zinc deficiency.

4. **Write the scientific term of the following (4 marks):**
 - a. Iron storage protein.
 - b. Vanadium-containing compounds.
 - c. Proteins that reduce cytoplasmic Zinc levels.
 - d. Its synthesis is stimulated by iron overload.
 - e. Catalyzes Iron oxidation.
 - f. Mediates import of divalent metals.
 - g. Chromium binding protein.
 - h. An inorganic element that is required only by plants and plays a structural role in plant cell wall.

5. **What physical techniques could be used most efficiently to determine the following (10 marks):**
 - a. The presence of a known metal ion in a biomolecule.
 - b. Identification of oxygen-iron bonds (Fe=O).
 - c. The coordination geometry of heme-containing porphyrins.
 - d. The identity of the donor atoms that coordinate the metal ion in a protein.

6. **Describe Na⁺/K⁺/MgATPase: Flip-Flop-mechanism? (5 marks)**

7. **Choose the correct answer of the following questions (10 marks):**
 - i. **What is the coordination of proteins to transition metals?**
 - a. Amino acids bind transition metal-1
 - b. Direct coordination to metal active-site
 - c. Indirect coordination: cofactors active-site
 - d. All of the above

ii. Copper is _____.

- a. Lewis acid
- b. Not Redox catalyst
- c. Electron transfer and oxygen carrier
- d. Charge carriers

iii. What is the reaction catalyzed by alcohol dehydrogenase?

- a. Oxygen transport
- b. Oxidation of primary alcohol
- c. Peptide hydrolysis
- d. Deoxygenation of nitrite


iv. Functional roles of biological magnesium and calcium are _____.

- a. Osmotic and electrochemical gradients
- b. Enzyme activators
- c. Photosynthesis
- d. Insoluble phosphate

Good luck

Prof. Dr. Mohamed El-Zaria

Dr. Hany Elsayy

 1989	Tanta University			
	Faculty of Science			
	Department of Chemistry			
Final exam. for senior students of chemistry				
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Date:	Jan. 5, 2013	Term: First	Total assessment Marks: 60	Time allowed: 3 H

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C. Write only two reasons for the weakness of collision theory. (2 Marks)

EXAMINERS:	1- Prof. Dr. Shakir T. Abdel-Halim
	2- Dr. Eman Fahmy Aboelfetoh

**Final Exam of "Stereochemistry, Polymers, Vitamins & Steroids"
for B.Sc. Students (Chemistry Section)**

Answer **only Five** Questions of the following:

- 1) Write briefly on the following :
 - a- Characteristics of condensation polymerization .
 - b- Preparation of phenol-formaldehyde resins .
 - c- Techniques of condensation polymerization .
 - d- Characteristics of addition polymerization .
- 2) Write on the following :
 - a- Suspension polymerization .
 - b) Vulcanization of rubber .
 - c- Preparation of block copolymers by living polymers .
 - d- Isomerization polymerization .
- 3) By equations show the followings :
 - a- Position of the angular methyl groups in cholesterol .
 - b- Elucidation of the ergosterol structure .
 - c- Transformation of lithiocholic acid to cholanic acid .
 - d- On treatment of B₁ (C₁₂ H₁₈ ON₄ Cl₂ S) with Na₂ SO₃ / SO₃ at room temperature give two compound A & B. Elucidate the structure of A & B.
 - e- Synthesis of androsterone .
- 4) Try the following conversions :
 - a- Transformation of cholesterol into :
 - i- Testosterone .
 - ii- Progesterone .
 - iii- Cholanic and allocholanic acid .
 - b- Transformation of 6-methoxytetralone to oesterone .
 - c- p-Anisaldehyde to 4,4'- dihydroxy diethyl stilbene .
- 5) a- Describe the synthesis of (±)-3- ethyl-2-hexanol .
 - b- Draw and name the isomers of the following compounds:
 - i- 2- butanol .
 - ii- Aldotetrose.
 - iii- 2,3- Dichlorobutane.
 - c- Explain how can you differentiate between the geometrical isomers of maleic and fumaric acids (by all methods) .

6)a- Describe the resolution of (\pm)- phenylglycine using a chiral stationary phase (**CSP**) .

b- Explain the resolution of (\pm)-1- phenyl-1- aminopropane using (R)- (-)- mandelic acid .

c- Give an account on:

i- Mutarotation .

ii- Racemization process .

iii- The specific optical rotation (α) ? Describe its measurements .

d- The chemical shift of ethylenic proton δ_H of stilbene was found experimentally to be 6.95 ppm. What is the geometrical isomer of stilbene (substituent constants for chemical shift are: $\text{Ph}_{\text{gem}} = 1.35$, $\text{Ph}_{\text{cis}} = 0.37$, $\text{Ph}_{\text{trans}} = - 0.10$ ppm).

===== Good Luck =====

FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

EXAMINATION for Seniors (Fourth Year) students OF Biochemistry

COURSE TITLE:	Immunology and Molecular Biology		COURSE CODE: 14061
DATE: 5-1-2013	JANUARY, 2013	TERM: FIRST	TOTAL ASSESSMENT MARKS: 60 TIME ALLOWED: 3 HOURS

Section Immunology: (40 marks)

1- Pregnant woman went to doctor to check up for her infant. Doctor required some biochemical analysis as Toxoplasmosis, rubella, CMV and Rh Discuss the following: (10 marks)

a- Complement fixation test for rubella, if this patient had rubella determine the concentration of Ab and Ag by ELISA test

b- Determine Rh by Coomb's test.

c- If mother is Rh⁻ and baby Rh⁺ Discuss this type of hypersensitivity

2- Illustrate with a diagram of the following (10 marks)

a. Immunoglobulin that is the major in external secretion

b. The thymus structure and discuss the maturation of thymocyte

c. Ab concentration in triggering of immune response for Toxoplasmosis

d. Arthurs reaction

3- Discuss the following: (10 marks)

a. Immune response of large polymeric molecule with multi-repeating Ag-determinant

b. Eosinophil cationic proteins

c. Types of monocytes according their tissue function and importance of macrophage as Ag-presenting cell

d. Sensitization phase of anaphylactic reaction

4- Give account of each the following: (10 marks)

a. Forces between Ag and Ab

b. Biological function of complement

c. T-cell markers

d. Domains of immunoglobulins

Section (Molecular Biology): (20 marks).

Answer all the following questions:

1- Give accounts of each of the following (10 marks)

a- Determination of T_m with different DNA base sequence and their relation to absorption of U.V. wave length at 260 nm and annealing temperature.

b- Ori C in the initiation of DNA replication

c- Genetic code and Wobble concept

d- Repression process and give example

2- a- Write the chemical structure of double strand of DNA that sense strand (3'---5') contained AGCT. If This double strand is exposed to helicase and then to 3' exonuclease, what is the first product released first from both strand.----- (4marks)

a- Compare between each of the following:----- (6marks)

1- RNA and DNA and polymerase I in their function and structure

2- Initiation of transcription of mRNA and initiation of protein synthesis

Prof. Tarek M. Mohamed; Prof. Ehab M. M. Ali

Section C: Molecular spectroscopy. (20 marks)

1. Choose the correct answers: (write your choice only) (6 marks)
 - a- How many normal modes of vibration does methane have?
 - i- 15
 - ii- 12
 - iii- 9
 - iv- 6

(1 mark)
 - b- The width of a spectral band or line is affected by
 - i- Band position.
 - ii- Collision broadening
 - iii- Population of states
 - iv- Spacing between the energy levels.

(1 mark)
 - c- Symmetric tops rotor as NH_3 has three moments of inertia I_a , I_b and I_c such that:
 - i- $I_a = 0, I_b = I_c$.
 - ii- $I_a = I_b \neq I_c$.
 - iii- $I_a = 0, I_b \neq I_c$.
 - iv- $I_a \neq I_b \neq I_c$.

(1 mark)
 - d- For anharmonic oscillator potential energy diagram of diatomic molecule, the transition $v_1 \rightarrow v_2$ is called:
 - i- First overtone.
 - ii- Fundamental absorption band
 - iii- Second overtone -
 - iv- Hot band

(1 mark)
 - e- For anharmonic oscillator potential energy diagram of diatomic molecule, the transition $v_0 \rightarrow v_2$ is called:
 - i- First overtone.
 - ii- Fundamental absorption band.
 - iii- Second overtone.
 - iv- Hot band.

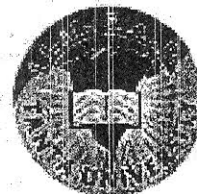
(1 mark)
 - f- The relative intensities of rotational spectral lines are function on
 - i- Boltzmann distribution function $[\exp(-E_J / KT)]$.
 - ii- Cell length.
 - iii- Number of fold degeneracy $(2J+1)$.
 - iv- $(2J+1) \cdot \exp(-E_J / KT)$

(1 mark)
2. Put (✓) at the correct sentence and (X) at the wrong one. (don't write the sentence). (5 marks)
 - a- Frank-Condon principle governs the relative intensities of transitions between vibrational energy levels of different electronic states. (1 mark)
 - b- A progression in absorption electronic spectrum is a series of bands with a common lower vibrational level. (1 mark)
 - c- Polarizability of H_2 molecule changes as the molecule vibrates. (1 mark)
 - d- The population in vibrational energy levels v_1 and v_0 are equals at 300 K. (mark)
 - e- Term symbol is an exact notation used in spectroscopy to define and characterize the energy states of atoms and molecule. (1 mark)
3. Draw an energy diagram to show Raman effect (Raleigh scattering, stokes and anti-stokes Raman). (3marks)
4. Compare between the energy levels and the position of rotational spectra in rigid and non-rigid di-atomic rotor. (3marks)
5. (3marks)

The fundamental and first overtone of $^1\text{H}^{35}\text{Cl}$ observed at 2886 cm^{-1} and 2668 cm^{-1} respectively. Calculate:

 - a- Equilibrium vibration frequency,
 - b- Anharmonicity constant.

EXAMINERS:	Section A: Prof. Dr. Shaker Abd-Elhalem..	Section C: Prof. Dr. Samy Salem Assar.
	Section B: Dr. Eman Fahmy	



Tanta University – Faculty of Science-
Chemistry Department

Final Examination for Bs.C (Chemistry)

Inorganic Chem.

Jan. 2013

Time : 3 Hrs

Section(A) Answer the following Questions. (20 Degree)

- 1) a. Explain Why instability of Sigma bonded alkyls & aryls of the transition metals
b. Give a catalytic cycle for HCo(CO)_3 catalyzed isomerization of allyl alcohol to propanaldehyde.
c. Explain How Fe(CO)_5 serves as a Catalyst for water gas shift reaction.
- 2) a. Give a catalytic cycle for $\text{IrCl(CO)(PPh}_3)_2$ catalyzed hydrosilylation of alkenes .
b. Show that ferrocene and Tri- μ -Carbonyl hexacarbonyl di-iron obey the 18-electron rule (At.no.Fe =26) .
c. Outline the main steps by which Ziegler- Natta polymerization proceed .

Section(B) Answer the following Questions. (20 Degree)

- 1) For a complex $[\text{Mn(H}_2\text{O)}_6]\text{Cl}_3$, the value of Δ_0 is 250 kJ/mol, while for complex $\text{K}_3[\text{Mn(CN)}_6]$, the value is 460 kJ/mol. (Mn 25).
 - a- What is the expected pairing energy value of the central metal ion? Select one value of: 150, 335 or 460 kJ/mol.
 - b- Calculate the CFSE for high spin complex
 - c- Calculate the magnetic value for low spin complex
- 2) a- Discuss the factors affecting the value of Δ_0
b- Define the Spectrochemical series
c- For hexaaqua chromium(II) chloride, Δ_0 is 13900 cm^{-1} . Calculate the experimental value of the heat of hydration if the heat of hydration when there is no CFSE is 436 kcal/mol . ($1 \text{ kcal/mol} = 350 \text{ cm}^{-1}$). Cr= 24.

Section C:

(20 Degree)

1.a- Choose the correct answer

1. How many total isomers (structural isomers and stereoisomers) exist for the complex ion $[\text{Co(NH}_3)_5\text{Cl}]^{2+}$
 - a. 1
 - b. 2
 - c. 3
 - d. 4

2. The type of isomerism in the following two linear complex ions $[\text{Cl-Ag-SCN}]^{-1}$ $[\text{SCN-Ag-Cl}]^{-1}$ is
- geometric isomers
 - linkage isomers
 - optical isomers
 - the same
3. For the coordination compound, $\text{Na}_2[\text{Cd}(\text{en})(\text{CN})_4]$, what are the coordination number (C.N.) and oxidation number (O.N.) of the central metal ion.
- C. N. = 4, O. N. = +2.
 - C. N. = 5, O. N. = +2.
 - C. N. = 5, O. N. = +3.
 - C. N. = 6, O. N. = +2.
4. According to Werner's theory, The total number of chloride ions for $\text{CoCl}_3 \cdot 5\text{NH}_3$ equals
- 1
 - 2
 - 3
 - zero
5. Which of the following species cannot be bridging ligand?
- OH^-
 - SO_4^{2-}
 - NH_3
 - F^-
6. The complex ion $[\text{Zn}(\text{NH}_3)_2\text{Cl}_2]^{2+}$ does not exhibit cis-trans isomerism. The geometry of this complex must be
- tetrahedral
 - trigonal bipyramidal
 - square planar
 - either tetrahedral or square planar

1.b- Explain, with examples, only five of the methods used for determining the complex formation in solution.

2.a- Write the formula the following complexes:

- sodium dioxalatodiaquanickelate (II).
- μ -hydroxo-bis{penta amine chromium (III)}chloride.
- Tetra amine cobalt(III) hexachloro copperate (III).

2.b- Sketch the isomers and indicate the types of isomerism for the following:

- bis (2,3-diamino butane) platinum(II) ion.
- Bromo pentaamine cobalt(III) sulfate.

With best wishes

Prof. Dr. Mohamed Gaber

Prof. Dr. Said Amer

Dr. Hoda El-Ghamry



Tanta University
Faculty of Science
Department of Chemistry

Final examination for the B.Sc degree Bio Chemistry Section

Organic spectroscopy and physical organic chemistry
Jan 2013

Time Allowed: 3 Hours

Section A: Organic spectroscopy


- i- What are the auxochrome, hypochromic shift, hyperchromic shift and hypsochromic shift. Identify the chromophoric groups in: toluene, butanone, cyclohexene and acetophenone.
- ii- The types and electronic transition which cause the absorption in the UV spectra in the following compounds:
 $\text{C}_6\text{H}_5\text{CH}=\text{CH}_2$, $\text{CH}_3\text{COCH}=\text{CH}-\text{CH}_3$ and $\text{CH}_3-\text{CH}_2\text{I}$.
- iii- Explain the following:
- a- The $\nu \text{C}=\text{O}$ of formaldehyde, acetaldehyde and acetone decreases in this order.
- b- The $\nu \text{C}=\text{O}$ of acetone, chloroacetone and dichloroacetone increases in this order.
- c- Fulvene absorb at long wave length than benzene, while phenancerene absorb at short wave length than anthracene.
- iv- Discuss the IR spectra in the following compounds: allenes, dienies, anhydrides, acetylene and deutro acetylene.
- v- Why the vibrational frequency of endocyclic double bond is increased as the ring size increased, while the exocyclic double increased as ring size decreased.

Reactions Mechanism: [30 Points].

Answer the following questions . [2 Points each question]

- Which of the following is a polar solvent?
A) Hexane B) carbon tetrachloride C) Benzene.
D) Dimethyl sulfoxide.
- Reaction of 2-Methyl-1-chloropropane with alcoholic potassium hydroxide to 2-methylpropene occurs through what mechanism?
A) S_N1 B) $E1$ C) $E2$ D) S_N2 E) A and C.
- Which of the following groups is the best nucleophile in S_N2 reactions?
A) F^- B) Br^- C) I^- D) Cl^-
- Rank the following radicals according to their stability (1= the most stable):
A) Ethyl radical. B) Benzylic radical.
C) Isopropyl radical. D) TEMPO
- Which of the following statements correctly describe(s) S_N1 reaction of alkyl halide (RX)?
A) Rate = k [base] B) Rate = k [base][RX]
C) Rate = k [RX] D) The reactions occur in two steps.
E) The reactions occur in one step.
- Discuss the kinetic isotope effect (give examples).
- Complete the following equations:
A) $Br^\cdot + PhCH_2CH_3 \rightarrow$
B) $R^\cdot + \text{Styrene} \rightarrow$
- Discuss the mechanism for the following reaction:
2,4-Dinitrochlorobenzene + NaOH \rightarrow 2,4-dinitrophenol.
- Provide the structures of the following:
A) THF B) Acetonitrile C) DMF.
D) Diphenylpicrylhydrazyl radical.
- The rate of an S_N2 reaction runs faster in which of the following solvents (explain your answer):
A) Ethyl alcohol B) DMF.
- Which of the following is a persistent radical (explain your answer):
A) Methyl radical B) Isopropyl radical C) Benzylic radical.
D) 2,6-Di-tert-butyl-4-methylphenoxy radical.
- Which of the following reactions exhibits primary kinetic isotope effect? (Explain your answer). A) $E1$ B) $E2$.
- Arrange the following compounds in the order of reactivity towards S_N2 displacement.
 $CH_3CH_2CCl(CH_3)_2$, $CH_3CH_2CH_2CH_2Cl$, $CH_3CH_2CHClCH_3$
(A) (B) (C)
- Racemisation of configuration is associated with which of the following? (Explain) A) S_N1 reactions B) S_N2 reactions.
- Discuss the thermal methods for generation of free radicals.

2013/2014

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR LEVEL FOUR STUDENTS (SEMSTER 1) OF CHEMISTRY/BIOCHEMISTRY			
	COURSE TITLE:	CLINICAL BIOCHEMISTRY		COURSE CODE: BC4105
	DATE: 2013/2014	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOUR

Answer the following questions:

1. If 2160 ml of urine of an adult patient is collected over the 24 hour period and the concentration of urea in the urine is 1.02 g% and that in the plasma is found to be 25 mg/dl. What is the clearance of urea (expressed as %)? Comment on the results. (5 marks)
2. What are the non-enzyme markers of Myocardial infarction? List and explain (4 marks).
3. By using complete chemical equations, explain the Heme catabolism? (6 marks)
4. **Write the scientific term of the following (5 marks):**
 - a. Excessive clotting and occlusion of major vessels.
 - b. The concentration of a substance in blood beyond which, it is excreted in urine.
 - c. It is a patchy thickening of an artery caused by formation of cholesterol - lipid rich plaque.
 - d. Arresting the flow of blood from an injured vessel.
 - e. Maximum capacity of the kidneys to absorb a particular substance.
5. **By using fully labeled diagram, explain the following (12 marks):**
 - a. Formation of tactoids and sickled erythrocytes.
 - b. Platelet phase and the formation of atherosclerotic plaque .
 - c. Intrinsic pathway of blood coagulation.

6. Explain (12 marks):


- a. The preliminary investigations to RFTs.
- b. The cause of hypoalbuminemia.
- c. Newer risk factors for atherosclerosis.
- d. The non-respiratory functions of lungs.

7. Compare between the Electrograms of (6 marks):

- a. Serum proteins in chronic hepatitis and in Multiple myeloma.
- b. Diagnosis of sickle cell triat and sickle cell disease.

**Good luck
Dr. Hany Elsayy**

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY		
	EXAMINATION FOR LEVEL FOUR STUDENTS (SEMSTER 1) OF CHEMISTRY/BIOCHEMISTRY, GEOLOGY, MICROBIOLOGY, AND ZOOLOGY		
	COURSE TITLE:	BIO-INORGANIC CHEMISTRY	COURSE CODE: CH4159
DATE: 1 ST JANUARY, 2014	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOUR

1. **Only by using fully labeled diagram, explain the following (9 marks):**
 - b. The role of Selenium in the mechanism of action of Glutathione peroxidase.
 - c. The pathway of Vanadium accumulation and mechanism of Vanadium reduction.
 - d. Copper homeostasis.

2. **What are siderophores? Mention their types? Give one example for each type? (4 marks)**

3. **List and explain (8 marks):**
 - a. The biological functions of Silicon.
 - b. The treatment of Cyanide toxicity.
 - c. The biochemical basis of Lithium treatment of psychiatric disorders.
 - d. The symptoms of Zinc deficiency.

4. **Write the scientific term of the following (4 marks):**
 - a. Iron storage protein.
 - b. Vanadium-containing compounds.
 - c. Proteins that reduce cytoplasmic Zinc levels.
 - d. Its synthesis is stimulated by iron overload.
 - e. Catalyzes Iron oxidation.
 - f. Mediates import of divalent metals.
 - g. Chromium binding protein.
 - h. An inorganic element that is required only by plants and plays a structural role in plant cell wall.

5. **What physical techniques could be used most efficiently to determine the following (10 marks):**
 - a. The presence of a known metal ion in a biomolecule.
 - b. Identification of oxygen-iron bonds (Fe=O).
 - c. The coordination geometry of heme-containing porphyrins.
 - d. The identity of the donor atoms that coordinate the metal ion in a protein.

6. **Describe Na⁺/K⁺/MgATPase: Flip-Flop-mechanism? (5 marks)**

7. **Choose the correct answer of the following questions (10 marks):**
 - i. **What is the coordination of proteins to transition metals?**
 - a. Amino acids bind transition metal-1
 - b. Direct coordination to metal active-site
 - c. Indirect coordination: cofactors active-site
 - d. All of the above

ii. Copper is _____.

- a. Lewis acid
- b. Not Redox catalyst
- c. Electron transfer and oxygen carrier
- d. Charge carriers

iii. What is the reaction catalyzed by alcohol dehydrogenase?

- a. Oxygen transport
- b. Oxidation of primary alcohol
- c. Peptide hydrolysis
- d. Deoxygenation of nitrite

iv. Functional roles of biological magnesium and calcium are _____.


- a. Osmotic and electrochemical gradients
- b. Enzyme activators
- c. Photosynthesis
- d. Insoluble phosphate

Good luck

Prof. Dr. Mohamed El-Zaria

Dr. Hany Elsawy

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT CHEMISTRY – BIOCHEMISTRY SECTION			
	EXAMINATION FOR SENIORS (4 TH YEAR) STUDENTS OF BIOCHEMISTRY			
	COURSE TITLE:	Biotechnology - Ph. D. Afrah Fatthi Salama		COURSE CODE: BC4244
DATE:	JUNE 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50	TIMELLOWED: HOURS

ANSWER ALL THE FOLLOWING QUESTIONS (20 Marks)

I) Give Brief account on:


1. How can occur diagnosis for genetic disorders? What is the importance of restriction enzyme analysis and synthetic oligonucleotides?
(3Marks)
 2. What is the gene therapy, giving example?(3 Marks)
 3. What is DNA Fingerprints and its applications?
 4. By figure only, describe the use of enzymes in processing starch? (2Marks)
 - 5- What are causes of thalassemia?
-

II)1-How can genetic engineering be applied in the pharmaceutical industry, and what are its applications?

- 2- How vaccine can be formulated using Biotechnology?
- 3- Give notes (in points) about the different uses of enzymes in solutions?
- 4- What is the nature of cloning vectors, giving two examples?

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT CHEMISTRY – BIOCHEMISTRY SECTION			
	EXAMINATION FOR LEVEL 4 SEMESTER 2 (4 TH YEAR) STUDENTS OF BIOCHEMISTRY			
	COURSE TITLE:	Drug metabolism		COURSE CODE: BC4254
DATE: 15/6/2015	JUNE, 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

ANSWER ALL THE FOLLOWING QUESTIONS

I- Define the following:

(10 Marks)

- 1- Chemotherapeutic agent
- 3- Lead discovery
- 5- Drug metabolism

- 2- Bioavailability
- 4- Polarity of drug solubility

II- Give short notes on the following:

(19 Marks)


1. Carrier prodrugs and how to minimize the side effect.
2. Biological factors affecting of drug metabolism.
3. Glucuronidation reaction in phase I drug metabolism.
4. Reduction reaction in phase I drug metabolism.
5. Full mechanism of oxidation by Cytochrome P450 system.
6. Many drugs are taken orally. State three other ways in which drugs may be taken by a patient.

III- Answer of the following questions:

(21 Marks)

1. How could avoid microbial deterioration interaction between compounds?
2. Why are chemical structure for classification?
3. Write the bond required between drug and receptor How could drug avoid gastric fluid from hydrolysis.
4. How could drug avoid gastric fluid from hydrolysis?
5. Why do they add flower pot cyclodextrin on prostaglandin?
6. What is the importance of random screening soil?
7. Write the advantages of Microbial sources.

With my best wishes
Prof. Tarek M Mohamed
Dr.Abeer khamis

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT CHEMISTRY – BIOCHEMISTRY SECTION			
	EXAMINATION FOR LEVEL 4 SEMESTER 2 (4 TH YEAR) STUDENTS OF BIOCHEMISTRY			
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 Dr.Abeer khamis

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT CHEMISTRY – BIOCHEMISTRY SECTION			
	EXAMINATION FOR LEVEL 4 SEMESTER 2 (4 TH YEAR) STUDENTS OF BIOCHEMISTRY			
	COURSE TITLE:	Chemotherapy		COURSE CODE: BC4252
DATE:	17 JUNE, 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

**ANSWER ALL THE FOLLOWING QUESTIONS
(10 marks each)**

- 1- Classify chemotherapeutic agents according to their mechanism of action?
- 2- What is chemotherapy resistance and how can overcome?
- 3- Antimicrobial agents has role in targeting cell wall, how this occur, giving Example?
- 4- What is the role of polyphenols as chemotherapeutic agents?
- 5- Give examples for antifungal agents, illustrating their mechanism?
- 6- What is malaria? How can occur infection, illustrating life cycle?
- 7- Give examples for antiviral compounds, illustrating their mechanism of action?
- 8- Explain characters of the ideal antiviral therapy. Giving example, mechanism?
- 9- What are hormones of the pituitary gland? Explain thyroid dysfunction and cases?
- 10- What cause of diabetic? What are anti-diabetic drugs?

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT CHEMISTRY – BIOCHEMISTRY SECTION			
	EXAMINATION FOR SENIORS (4 TH YEAR) STUDENTS OF BIOCHEMISTRY			
	COURSE TITLE:	Biotechnology - Ph. D. Afrah Fatthi Salama		COURSE CODE: BC4244
DATE:	JUNE 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: HOURS

ANSWER ALL THE FOLLOWING QUESTIONS (20 Marks)

I) Give Brief account on:

1. How can occur diagnosis for genetic disorders? What is the importance of restriction enzyme analysis and synthetic oligonucleotides?
(3Marks)
2. What is the gene therapy, giving example?(3 Marks)
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