	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	FINAL EXAM FOR LEVEL2 STUDENTS (DOUBLE MAJOR)			
	COURSE TITLE:	KINETIC THEORY OF GASES		COURSE CODE: CH2242
DATE	JUNE10, 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2H

Answer All Questions (50 marks)

1- Put true or false sign and correct the false answer? (10 marks)

1. Heavier gas molecules move faster than lighter molecules.
2. The gas viscosity increases as the pressure increases.
3. Collision cross section is the average distance a molecule travels between collisions.
4. A diatomic molecule has 5 degrees of freedom.
5. The mean free path decreases as the gas density increases.

2- Complete the following sentence: (20 marks)

1. Effusion of gases is defined as
2. All gases at a given temperature have the same
3. According to the equipartition of energy principle the average energy for each vibrational degree of freedom is.....
4. Increasing the number of gas molecules will the mean free path.
5. For triatomic molecule the average total energy per mole is.....
6. is the number of variables required to describe the motion of a particle completely.
7. When the two gas molecules are headed in the same direction the consequent collision is called.....

Turn over the paper

8. The viscosity of gases increases as temperature increases. This is because
9. The r.m.s. velocity for hydrogen at 25°C will be m/s.
10. The molecular collisions are assumed to be elastic this means.....

(4)- Write the mathematical equations (define its parameters) describes the following: (14 marks)


1. Mean free path
2. The collision frequency if each sphere is collides with the other.
3. Heat capacity at constant pressure for a gas.
4. Poiseuille's equation
5. The dependency of the barometric pressure on the altitude.
6. The volume excluded per mole of gas.
7. The relation between the thermal conductivity coefficient of a gas and the viscosity of a gas.

(5)- Answer the following? (6 marks)

1. If equal amounts of helium and hydrogen are placed in a porous container and allowed to escape, which gas will escape faster and how much faster?
2. Use the van der Waals equation to calculate the pressure of a sample of 5 moles of oxygen gas in a 10 L vessel at 10°C where $a(\text{O}_2) = 1.36 \text{ L}^2 \text{ atm/mol}^2$ and $b(\text{O}_2) = 0.032 \text{ L/mol}$.

Best Wishes ...

Dr. Eman Fahmy Aboelfetoh

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY			
	EXAMINATION FOR JUNIORS (THIRD YEAR) STUDENTS OF CH/ZO			
	COURSE TITLE:	ENTOMOLOGY		COURSE CODE:ZO 2244
DATE 8.6.2015	JUNE, 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS:150	TIME ALLOWED: 2 HOURS

Answer the following questions:

First question: state if the phrase is true or false (22 marks)

1. The adults of Suborder: Cyclorrhapha have stylet antennae.
2. May flies are used for monitoring the quality and health of aquatic environment.
3. The vast majority of insects are harmful, while a few are beneficial.
4. The dominance and success of insects are attributed to the possession of 6 legs.
5. All ametabolous insects are winged.
6. The fore and hind wings of order Isoptera are similar.
7. The integument of insects is an effective barrier against many pathogens and insecticides.
8. The clypeus is separated from the frons by clypeo-labral sulcus.
9. In the legs of human louse, the tarsus is two segmented.
10. The antennae of honey bee are of the stylet type.
11. The frenulum of female moths consists of single strong spine.

Second question: Fill in the blanks with the appropriate words: (30 marks)

1. The honeybees are an example of social life, where a hive contains 3 castes, and
2. The red palm weevil is a serious pest for in Egypt.
3. In Hymenoptera, Sex of eggs is determined by
4. Subclass: Apterygota include order
5. According the geological time scale, insects appear in the age
6. Thebears the median ocellus, while the two lateral ocelli are on the.....
7. The antenna of male mosquito are....., while those of the female mosquito are.....
8. In the piercing sucking M.P (animal feeder) the food channel is between.....and.....
9. The styli abdominal appendages present in.....borne on the.....
10. The siphoning mouth parts are found in.....

Third question: Correct the following statements (10 marks):

1. The cuticle is a cellular layer secreted by the epidermis.
2. In plumose antennae the segments are covered with few hairs.
3. In the fibula coupling mechanism of wings the costal margin of the hind wings bears a row of hooks, which fasten into a fold of the fore wing.
4. The hind legs of honey bee worker are used as toilet organs.
5. In aristate antenna the last segment is bearing an elongate terminal style-like process.

Fourth question: Choose the correct answers in the following: (28 marks)

1. The order Hemiptera contains.....
A. Bed bugs and stink bugs. B. Chewing and sucking lice.
C. Roaches and mantids. D. Crickets and grasshoppers.
2. Human disease pathogens are transmitted by
A. Hymenoptera. B. Thysanoptera. C. Diptera . D. All of these.
3. Which of the following is true ?
A. All arthropods are insects. B. All Insects are Crustaceans.
C. All insects are Arthropods. D. All Crustaceans are insects.
4. The potent vector of plague that is caused by the bacterium *Yersinia pestis*, is the.....
A. rate flea. B. human flea. C. dog flea. D. cat flea.
5. Family Aphididae is commonly known as
A. plant bug. B. plant lice. C. thrips. D. bed-bug.
6. Grasshopper has special receptors for sound (tympana) on the sides of the
A. 1st abdominal segment. B. last thoracic segment. C. fore leg. D. hind leg.
7. In the siphoning mouth parts the maxillary palps are (present-absent-vestigial).
8. In moniliform antenna the segments are (cylindrical-spherical-triangular).
9. The stinging apparatus of hymenoptera is (male reproductive appendages-female reproductive appendages-non reproductive appendages).
10. The fore wings of cockroaches are (tegmina-elytra-hemielytra).
11. Royal jelly is secreted by (salivary gland-mandibular gland – hypopharyngeal gland) of worker honey bee.
12. Fore gut is (ectodermal-endodermal-mesodermal) in origin.
13. Most of digestion takes place in (foregut-midgut- hindgut).
14. Circulatory system of insect is (dorsal closed-dorsal open-ventral open).

Fifth question (10 marks):

1. Compare between the characteristics of Adephaga and Polyphaga (5 marks).
2. Enumerate the main characters of Termites (white ants). (5 marks)

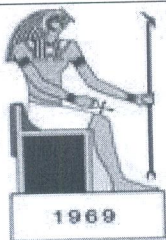
Sixth question: write a short note on the following (50 marks, 10 marks each)

1. Types of the enzyme and secretion in midgut of insects.
2. Mechanism of excretion through malpighain tubules of insects.
3. Blood function of insects.
4. Types of reproduction in insects.
5. Honey stomach of workerhoney bee.

Good Luck

EXAMINERS	PROF.DR. ELSAID AHMED NAEIM
	DR. IMAN ELHUSSEINY DR.WESAM MESHRIFF

Tanta University
Faculty of science
Department of zoology



Second term Examination for second year student(Chemistry-zoology)

Name:- Chordate

DATE:	May:-2014-2015	TOTAL ASSESSMENT MARKS:150	TIME ALLOWED: 2H

Part One

The First Question.....20 points

Complete

- 1- In Balano glossus the skeletal plate present in
- 2- The Larva of Balanoglossus is
- 3- The taste buds of Dog fish is.....
- 4- In petromyzone the notochord consists of

The Second Question.....10 points

A- Identify the solenocyte?

B-Draw the holobranch of Dog fish?

The third Question.....45points

A)-Discuss the ammocete larva consider a connecting link between cyclostomata and cephalochordate?25 points

B)-Deduce why is amphioxus placed higher in phylogeny than tunicate?.....20points

Part two

Question1: Multiply choice: (60 Marks)

1)-Blood flows through the body of a amphibian in a

a. single-loop, open circulatory system. b. single-loop, closed circulatory system. c. double-loop, open circulatory system. d. double-loop, closed circulatory system.

2). Most amphibians exist as

a. aquatic larvae that breathe with gills and as terrestrial adults that breathe using lungs and skin.

b. aquatic larvae that breathe using lungs and skin and as terrestrial adults that breathe with gills.

c. terrestrial larvae that breathe with gills and as aquatic adults that breathe using lungs and skin.

d. terrestrial larvae that breathe with gills and lungs and as aquatic adults that breathe using skin.

3). The only places on Earth where most reptiles cannot live are very

a. hot areas. b. cold areas. c. dry areas. d. wet areas.

4) One way an ectotherm can warm its body is to

a. move into the shade . b. bask in the sun . c. speed up its metabolism.

d. crawl into an underground burrow.

5). Reptiles exchange gases through their

a. gills. b. skin. c. lungs. d. limbs.

6). The difference between reptilian eggs and amphibian eggs is that reptilian eggs

a. must develop in water. b. always hatch inside the mother's body.

c. are surrounded by a protective shell and membranes.

d. do not contain an embryo.

7). Which of the following is NOT a characteristic of all birds?

a. They have an outer covering of feathers. b. They maintain a constant internal body temperature.

c. They have two legs. d. They can fly.

8). Amphibian means

a. "two tails." b. "double life." c. "scaly-skinned." d. "three chambers."

9.) Most snakes have only one

a. external ear b. eye c. leg d. lung

10). In the roof of a snake's mouth, a pitlike sense organ that picks up airborne chemicals is the

a.gizzard b. allantois c. Jacobson's organ . d. sternum

11). Snakes can detect heat by means of heat-sensitive pits in the

a.-head b.-nose c.-tail d.-vertebrae

12). In comparing animals of the same size, we would expect that ectothermic ones _____ Than endothermic ones

a. consume more calories b. consume fewer calories

c. are more active on every cold nights

Question 2: (15 Marks)

Write short note (no more than 5 sentences for each)

A. Describe three adaptations that Aves have for flying.

B. Describe three adaptations that reptiles have for conserving water.

C. Amphibians are more sensitive than reptiles to changes in the environment, Why?

Part one:- Dr Atteyat Selim

Part two :- Dr Khirat



Tanta University
Faculty of Science
Department of Chemistry

Final Examination for Second and Third Level Students of Chemistry/ Geology,
Zoology, Microbiology, Botany, Entomology. Biochemistry)

Chemical Kinetics Chemistry

Course code: CH 2240

June 13th, 2015 Term: Second Total Assessment Marks: 100 Time Allowed: 2h

Answer all the following questions : (20 marks for each)

- 1- a) Discuss the factors affecting the reaction rate?
- b) An elementary reaction $2A + C \rightarrow D$, is second order in A and first order in C and the rate of this reaction is $2.5 \times 10^{-1} \text{ M/S}$.when the concentration of A, C and D are all 1.0 M. What is the rate constant of this reaction?
- 2- a) Define the rate equation of chemical reaction and discuss how can you determine it ?
- b) The following data were obtained in the decomposition of N_2O_5 in CCl_4 at 40 °C

t (sec)	600	1200	1800	2400	3000	∞
$\text{O}_2(\text{ml})$	6.30	11.40	15.53	18.90	21.70	34.75

Find out the order of this reaction and its half life time?

- 3- a) Enumerate the methods for determination the order of chemical reaction and discuss the differential method?
- b) The half-life for radioactive disintegration of radium is 1590 Yr . calculate the decay constant .In how many years will three-quarter of the radium have undergone decay? (The decay is first order)

(انظر خلفه)

4- a) Deduce the integrated rate equation of the opposing first-order reaction



b) The half-life of thermal denaturation of hemoglobin first order process has been to be 3460 Sec at 60 c° and at 65 c°. Calculate the activation energy (ΔE).


5- a) Write short notes about characteristics and classifications of catalysts and discuss the mechanism of chemical catalysis according to Arrhenius concept (Equilibrium treatment).

b) The reaction mechanism, $A + B \xrightleftharpoons[k_{-1}]{k_1} C \xrightarrow{k_2} P$ if $k_1 \gg k_{-1}$. Find out the rate law and the order of this reaction.

GOOD LUCK

Prof. Dr M. Y. EL SHEKH

Prof. Dr Hosny EL-Daly

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY			
	EXAMINATION FOR (SECOND YEAR) STUDENTS			
	COURSE TITLE:	Invertebrate biology		COURSE CODE:ZO2242
DATE:3-JUNE-2015	MAY, 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS:	TIME ALLOWED :2 HOURS

First question (30 marks)

A) Illustrate by drawing only the following structures:

(20 Marks)

- 1-V.S. of entire eye in *Nereis* sp.
- 2- Body wall of *Nereis* sp.

B) The structure of the digestive system is greatly affected by the mode of life which leeches lead. Discuss this sentence

(10 Marks)

Second question (50 marks)

Section I (10 marks)

A) Explain in full detail the structure of circulatory system in prawn and blood circulation.

(5 Marks)

B) Mention the characters of advancement of the phylum Arthropoda than phylum Annelida?

(5 Marks)

Section II (40 marks)

A-Complete:

(10 Marks)

- 1-.....andare examples of crustacean larvae.
- 2-.....differentiate between male and female spider.
- 3-Class Branchiopoda is divided into three Orders: two of them areand.....
- 4-Cyclops belongs to Order Cyclopoida because it has.....and.....
- 5-Scolopendra breathes throughwhile Scorpion through.....

B-Write short notes on:

(4 Marks)

A-Reproduction of Daphnia during the favorable condition.

C-Draw with fully labeled:

(8 Marks)

- A-Circulatory system of Spider.
- B-Digestive system of Scolopendra.

D-Choose the correct answer:

(10 Marks)

- 1- *Cypris* sp. is example of.....
a) Branchipoda b) Branchiura c) Ostracoda
- 2-.....is the excretory organ of *Iulus* sp.
a) Flame cells b) Malpighian tubules c) Green glands
- 3-Attach itself to human skin and causing skin itching.....
a) Soft tick b) Argulus c) Sarcophytes
- 4- Zoa larva develops to.....
a) Prawn b) Spider c) Scolopendera
- 5- Is hermaphrodite
a) Balanus b) Prawn c) Cyclops

E-Put (✓) or (x) and correct the wrong ones:

(8 Marks)

- 1-Ephippia is produced during the unfavorable condition. ()
- 2-Chelicera in scorpion and spider has the same function. ()
- 3-Head and abdomen are absent in Cirripedia. ()
- 4-Circulatory system of scorpion is closed system. ()

Third question (40 marks)

A) Mention the reasons for each of the following:

(10 marks)

- 1-Why the symmetry is lost in Gastropoda.

(انظر خلف الورقة)

- 2-Why the Chiton as Molluscan animal called primitive species.
- 3-Why Sepia has developed sense organs.
- 4-Anodonta has strong muscular system.
- 5-Molluscan animals have main organs for feeding.

B)-Complete the following:

(10 marks)

- 1-The umbo in some Molluscan animals is directed anteriorly making it possible to determine
- 2-The term of Cephalopoda means.....
- 3-Type of reproduction of Helix.....
- 4-The function of the funnel of Sepia
- 5-The development of Fertilized egg of Mollusca into 1..., 2..., 3.....

C)-Write short notes on the following with drawings:

(20 marks)

- 1-Nervous system of Sepia.
- 2-Respiratory system of Helix.
- 3-Types of sense organs of Mollusca.
- 4-Economic importance of Mollusca.

Fourth question (30 marks)

A) Give a short account on the following

(12 marks)

- 1- Mutable connective tissue (also called catch connective tissue).
- 2- Echinoderm Sensory Structures

B-Fill in the spaces

(6 marks)

- 1-Coelom = A fluid-filled cavity between and gut; lined by mesoderm. Two parts: Per visceral coelom and Water Vascular System - network ofcanals unique to echinoderms that branches into extensions which function in, feeding andexchange
- 2-The water vascular system in holothuroidea follow the same plan as in asteroids , except that(a).....
...(b)..... and(c).....
- 3- Nervous System in echinoderms, Decentralized,..... and.....

C-Choose the most correct:

(12 marks)

1. Which of the following is NOT true of echinoderms?

- A.They are all marine
- B.Adult echinoderms have a dorsal nerve cord
- C.Their larvae are planktonic
- D.Their larvae are bilaterally symmetrical
- E.Adult echinoderms have pentamerous symmetry

2. The oral surface of most echinoderms

- A.Is on its bottom side
- B.Is where its mouth is
- C.Is on its top side
- D.A and b are correct
- E.B and c are correct

3. Which of the following is NOT true about tube feet?


- A.The water vascular system ends in the tube feet
- B.Tube feet are muscular
- C.Tube feet are part of the endoskeleton
- D.Tube feet are used for locomotion
- E.Stimuli are received by the tube feet

4. Which of the following is NOT a diagnostic characteristic of echinoderms?

- A.Pentameral radial symmetry
- B.A water vascular system
- C.An internal skeleton
- D.Tentacles that are used for locomotion
- E.An organ system level of organization

(GOOD LUCK)

EXAMINERS	PROF. MOHAMED H. MONA	PROF. FADIA N. HEAEBA
	DR. MONA M. ELGAMAL	DR. NAGLAA S. GAESA

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR SOPHOMORES (SECOND YEAR) STUDENTS OF BIOLOGY (SPECIAL BIOCHEM., CHEM./BIOCHEMISTRY, CHEM./ZOOLOGY AND CHEM./ENTOMOLOGY)			
	COURSE TITLE:	INSTRUMENTAL ANALYSIS (1)		COURSE CODE: CH2244
DATE:	MAY 30, 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Question (I):

(25 mark)

A. Answer the following:

- 1- What is a photomultiplier tube? Describe what it does and how it works.
- 2- Most of phosphorescence cannot be recorded in solution at room temperature, why?

B. Choose the correct answer for the following:

- 1) Which of the following is not active in IR absorption spectroscopy?
 a) Cl_2 b) CHCl_3 c) CH_4 d) C_6H_6
- 2) Which is the preferred continuum source in visible region?
 a) Tungsten filament lamp b) Hollow cathode lamp c) deuterium lamp d) none of above
- 3) A photon whose wavelength is 200 nm is:
 a) a visible photon b) an ultraviolet photon c) an infrared photon d) a microwave photon
- 4) The excellent exciting light source used in the atomic absorption spectroscopy is:
 a) low pressure lamp b) hollow cathode lamp c) Xenon lamp d) tungsten-halogen lamp
- 5) Fluorescence occurs within:
 a) 10 s b) 10 ms c) 10 μs d) 10 ns

Question (II):

(25 mark)

Answer the following:

- 1- List the following in order of increasing energy and wavelength: x-rays, infrared light, visible light, radio waves, and ultraviolet light.
- 2- What are an absorption filter and a monochromator?
- 3- Explain the energy transitions caused by UV-VIS light absorption.
- 4- Describe two light sources used for UV-VIS spectrophotometry.

Question (III):

(25 marks)

A. Discuss briefly on each of the following:

- 1- Hock's law and draw three examples of IR absorption modes.
- 2- Two applications of UV-VIS spectrophotometry?
- 3- Steps of atomization in the flame of atomic absorption spectroscopy.
- 4- Variation of fluorescence intensity with concentration.

Question (IV):

(25 marks)

Draw the following:

- b) Block diagram showing all the components of a basic spectrophotometer.
- c) Energy transitions involved in fluorescence and phosphorescence.

B. Answer the following problem:

What is the absorbance given that the molar absorptivity is $2.30 \times 10^4 \text{ L.mol}^{-1}.\text{cm}^{-1}$, the pathlength is 0.05 cm, and the concentration is 0.0000453 M?

Good Luck

Examiners	Prof. Dr. Mohamad Mohamad Ayad Dr. Nagy Labieb Kamal
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Tanta University
Faculty of Science
Chemistry Department

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Final Exam (Organic Chemistry 3)

(CH2214)

2nd Level (Chemistry- Zoology)

June 2105.

Time: 2 hours.

Total marks: 150

Answer the following questions

- 1-Discuss the following: [18 Points]
 - A) Diels-Alder reaction (give examples).
 - B) Claisen condensation reaction (explain the mechanism of the reaction).
 - C) Reformatsky reaction (explain the mechanism of the reaction).
- 2- Carry out the following conversions: [12 Points]
 - A) Benzaldehyde to cinnamic acid.
 - B) Ethyl acetoacetate to 2-pentanone.
- 3- What statement about the aldol condensation is correct? [4 Points]
 - A) A Lewis acid is commonly used as a catalyst.
 - B) The initial step is probably the formation of a carbanion.
 - C) A Lewis base is employed to induce carbocation formation.
 - D) The carbon chain is lengthened through the elimination of 1 mole of water.
- 4- Write an account on non-kinetic isotope effect. [5 Points]
- 5- Discuss the mechanism of the following reactions: [12 Points]
 - A) Addition of HBr to 1,3-butadiene.
 - B) Addition of HCN to methyl vinyl ketone.
- 6-Which of the following reactions exhibits primary kinetic isotope effect? (Explain your answer). [5 points]
 - A) E1 reactions.
 - B) E2 reactions.
 - C) Nitration reaction of benzene.
- 7- Discuss the mechanism of the following reaction [5 points]
 $2,4\text{-Dinitrochlorobenzene} + \text{NaOH} \rightarrow 2,4\text{-dinitrophenol}.$
- 8- Which of the following is the best leaving group in S_N2 reactions? [5 points]
 - A) Cl⁻
 - B) Br⁻
 - C) I⁻
 - D) F⁻

9 -Which of the following statements correctly describe(s) S_N1 reactions of alkyl halide (RX)? [5 points]

- I) Rate = k [base] II) Rate = k [base][RX]
III) Rate = k [RX] IV) The reactions occur in two steps.
V) The reactions occur in one step.
VI) Rearrangements sometimes occur.
A) II and VI B) I only C) I and III
D) I and IV E) III, IV and VI.

10- The reaction of diethylmalonate with sodium ethoxide produces ethanol and a [4 points]
i- free radical ii- carbocation iii- molecular species
iv- carbanion v- carboxylate ion.

11 -Discuss S_N1 mechanism (give example) . [5 points]

12 -Arrange the following compounds according to their reactivity towards nucleophilic addition reactions to carbonyl group:[5 points]
Acetone, Formaldehyde, Acetaldehyde.

13 -Discuss the mechanism of nucleophilic addition reactions to carbonyl compounds. [5points].

14- Arrange the following compounds in the order of reactivity towards S_N2 reactions (explain your answer): [5 points]
(A) β -Phenylisopropyl bromide (B) Benzyl bromide
(C) α -Phenylethyl bromide.

15-Which statement is correct for an S_N1 reaction at a chiral carbon atom? [5 points]

- A)The product will be optically active, but have opposite configuration.
B)The reaction will involve racemation.
C) A carbanion is formed as intermediate.
D)The rate of reaction is a function of the concentration of the nucleophile.
E)The attacking group will be a strong electrophile.

16-The addition of Br_2 to trans-2-butene giving meso-2,3-dibromobutane can be explained by a mechanism involving: [5 points]

- A) A free radical. B) A carbocation.
C) A cyclic bromonium ion. D) A carbanion.
E) Simultaneous attack by bromine atoms.

17- Discuss the mechanism of Pinacol–Pinacolone rearrangement reaction. [5 points]

18- Which of the following statements correctly describe(s) E2 reactions of alkyl halide (RX)? [5 points]

I) Rate = k [base]

II) Rate = k [base][RX]

III) Rate = k [RX]

IV) The reactions occur in two steps.

V) The reactions occur in one step.

A) I and V

B) II and IV

C) II and V

19- The addition reaction of HBr to 1-butene in presence of peroxide can be explained by a mechanism involving: [5 points]

A) a carbanion.

B) a carbocation.

C) a cyclic bromonium ion.

D) free radicals.

20- Which two reaction types have the same initial step? [5 points]

A) S_N1 and E2 reactions

B) E1 and S_N1 reactions

C) S_N2 and E1 reactions

D) none of the above.

21- Circle the more likely mechanism for the reaction: [5 points]

Chlorobenzene + KNH₂ → aniline.

A) Aromatic electrophilic substitution.

B) Aliphatic Nucleophilic substitution.

C) Benzyne intermediate mechanism.

D) Nucleophilic aromatic bimolecular displacement mechanism.

22- Inversion of configuration is associated with which of the following?

A) E1 reaction

B) free-radical halogenation

[5 points]

C) S_N1 reaction

D) S_N2 reaction

E) none of the above.

23- Reaction of 2-Methyl-1-chloropropane with alcoholic potassium hydroxide to 2-methylpropene occurs through what mechanism? [5 points].

A) S_N1

B) E1

C) E2

D) S_N2

E) A and C.

24- Arrange the following compounds in the order of reactivity towards S_N1 displacement. [5 points]

CH₃CH₂CCl (CH₃)₂, CH₃CH₂CH₂CH₂Cl, CH₃CH₂CHClCH₃

(A)


(B)

(C)

25- Discuss the Free-energy profile for a reaction with an intermediate. [5 points].

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

**EXAMINATION FOR SOPHOMORES (SECOND LEVEL) STUDENTS OF
CHEMISTRY / BIOLOGY SECTIONS**

	COURSE TITLE: STEREOCHEMISTRY	COURSE CODE: CH 2246
DATE: 27 MAY, 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50
		TIME ALLOWED: 2 HOURS

Answer The Following Questions :

- 1) Compare between each of the following: (10 Marks)
 - i- Stereoselective addition of cis- and trans-2,3-diphenyl-2-butene.
 - ii- Diastereomers and Enantiomers.
 - iii- Racemization via cation and anion formation

- 2) Describe the separation of 2-aminobutane using (R)-(-)- mandelic acid . (7 Marks)

- 3) Mark (✓) or (X) and correct the false sentences: (8 Marks)
 - i- Mutarotation is the conversion of glucose to fructose . ()
 - ii- Stretching vibration of C=C of trans-stilbene is lower than that of cis-isomer. ()
 - iii- Trans-isomer of 2- pentene has lower λ_{max} and very lower ϵ than that of cis-isomer with UV- spectra . ()
 - iv- Fumaric acid readily forms with heating a cyclic anhydride while maleic acid does not give an anhydride under the same conditions. ()
 - v- Any molecule with a plane of symmetry or a center of symmetry must be achiral. ()

- 4) Explain the synthesis of (±)-2-methyl-1-hexanol using malonic acid . (7 Marks)

- 5) The chemical shift of ethylenic proton δ_H was found experimentally to be 7.65 ppm for α - methyl cinnamic acid . What is the geometrical isomerism of the above acid ? (substituent constants for chemical shift are : $-\text{Ph}_{gem} = 1.35$, $-\text{COOH}_{cis} = 1.35$, $\text{COOH}_{trans} = 0.47$, $-\text{CH}_3_{cis} = -0.26$, $-\text{CH}_3_{trans} = -0.29$ ppm) . (6 Marks)

- 6)a- Draw and name the isomers of the following compounds (with comment):(9 Marks)
 - i- Aldotetrose . ii- 2,3-Dibromobutane . iii-Dimethylcyclohexane .
 b- Draw the following compounds : (3 Marks)
 - i- (R)- 3-Hexanol . ii- (2S,3S)-2,3-Dichloropentane .

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