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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY		
	EXAMINATION FOR SECOND-YEAR STUDENTS (DOUBLE MAJOR PROGRAMS)		
COURSE TITLE:	INSTRUMENTAL ANALYSIS (1)	COURSE CODE: CH2244	
DATE: JUNE 3, 2017	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Question (1): Chose the correct answer for the following: [20 marks]

- The radiative $T_1 \rightarrow S_0$ process is....., while radiationless $S_1 \rightarrow T_1$ process is.....
 - an internal conversion
 - an intersystem crossing
 - an absorption
 - a phosphorescence
 - a fluorescence.
- In atomic absorption spectroscopy, which of the following statements is **FALSE**?
 - Flame is used to excite the element to a higher energy state.
 - A hollow-cathode lamp with a cathode made of the element to be analyzed is used to produce a wavelength of light specific for the material.
 - This light is absorbed by the ground state atoms in the flame.
 - There is a net decrease in the intensity of the beam.
- The term (I_t/I_0) is called.....
 - absorbance
 - opacity
 - extinction coefficient
 - transmittance
- What is the main light source used in fluorescence spectrometer?
 - deuterium lamp
 - xenon lamp
 - hollow cathode tube
 - tungsten lamp
- The atomization processes in flame atomic absorption spectrometer occurs in.....
 - photomultiplier tube
 - atomizer
 - nebulizer
 - flame
- In UV-VIS absorption spectroscopy, the UV absorption causes.....
 - change of nuclear spin
 - change of electron distribution in valance shell
 - change of configuration
 - change of electron distribution in inner shells
- In the atomic absorption spectroscopy, the combustion gas in the air-acetylene flame is.....
 - air
 - nitrous oxide
 - acetylene
 - oxygen
- Which of the following is not active in IR absorption spectroscopy?
 - Cl_2
 - $CHCl_3$
 - CH_4
 - C_6H_6
- Hydrogen lamp gives a continuum spectrum in the
 - IR region
 - UV region
 - Visible region
 - UV and visible regions
- What does the notation $n \rightarrow \sigma^*$ mean?
 - Absorption; transition from a quantum level n to σ^* MO.
 - Absorption; transition from a non-bonding MO to σ^* MO.
 - Emission; transition from a quantum level n to σ^* MO.
 - Emission; transition from a non-bonding MO to σ^* MO.

Question (2):

A. Answer the following:

[20 marks]

1. Illustrate with drawing the "Jablonsky diagram" and define the different processes of dissipating energy.
2. Draw a block diagram and steps of atomization in the flame of atomic absorption spectrometer.
3. Describe two light sources used for UV-VIS spectrophotometry.

B. Mark (✓) or (X) and give the reasons for each:

[10 marks]

1. The cells used for measuring VIS absorption spectra are made of quartz or glass.
2. Potassium bromide technique is used for measuring IR spectrum of solid sample.
3. Internal conversion is a radiative process from excited singlet to ground states.
4. Spectra of oxygen molecule can be recorded by Infrared spectrometer.
5. Unknown concentration of saturated hydrocarbons can be determined by UV spectrometers.

Question (3): Write short notes on each of the followings:

[20 marks]

1. Two applications of UV-VIS spectrophotometry.
2. Write the mathematical expression for fluorescence intensity and concentration at very low concentration, define each term, why the fluorescence intensity decreases at high concentrations?
3. IR principles and modes of vibration.
4. Deviation from Beer law due to chemical deviation.

Question (4):

A. Describe what it does and how it works:

[10 marks]

1. Photomultiplier tube.
2. Hollow cathode lamp.

B. Compare between each of the following:


[20 marks]

1. Electronic transition in organic and inorganic compounds.
2. Standard addition method and calibration method in photometric application of electronic absorption spectroscopy.
3. Nernst glower and Glycer lamp.
4. Potassium bromide and Nujol technique techniques in IR measurement.

=====*Best Wishes and Good luck*=====

Examiners	Prof. Dr. Ahmed Rehab Dr. Nagy Labieb Kamal
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 1969	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	5 JUNE, 2017	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50 TIME ALLOWED: 2H

Answer All Questions (50 marks)

1- Complete the following sentence: (28 marks)

1. Global warming is defined as.....
2. The unit of 1.5 atmosphere used to describe the pressure of a gas is equal to mmHg.
3. and are considered some of the man-made causes for global warming.
4. Poiseuille's equation for gases is represented by the following equation
5. For non-linear triatomic molecule the molar heat capacity at constant pressure is.....
6. Plasma "fourth state of matter" is defined as
7. As the pressure, the amount of oxygen available to breathe decreases.
8. A hot gas passing through a big spark will turn the gas stream into
9. and are considered some of the applications of gas liquefaction.
10. is specially designed to measure the atmospheric pressure, whereas can also be used to measure the pressures, which are lower than atmospheric pressure.
11. As the temperature increases the viscosity of gases increases. This is because

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2- Put true or false sign and correct the false answer? (18 marks)

- 1) For monoatomic gas like He or Ar, the total rotational kinetic energy represents the internal energy of the gas.
- 2) Smells of a perfume or meal in a room are examples of effusion in gases.
- 3) Viscosity of gas is the number of variables required to describe the motion of a particle completely.
- 4) The average kinetic energy is dependent of the mass of the molecule.
- 5) Pollution whether it is vehicular, electrical or industrial is the main contributor to the global warming.
- 6) The mean free path increases as the temperature increases.
- 7) Planting trees can help much in reducing global warming.
- 8) Landfills are the major contributor of methane and other greenhouse gases.
- 9) Van der Waal's equation corrects the non-ideality of real gases.

3- Answer the following (4 marks)

1. If the density of hydrogen is 0.090 g/L and its rate of diffusion is 5.93 times that of nitrogen, what is the density of nitrogen?
2. Calculate the root mean square speed in m/s of helium (He) at 30°C.


Best Wishes

Prof. Ahmed Borhan El-deen

Dr. Eman Fahmy Aboelfetoh

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السؤال الثاني

	TANTA UNIVERSITY FACULTY OF SCIENCE CHEMISTRY DEPARTMENT		
	FINAL EXAM FOR 2 nd LEVEL STUDENTS		
	COURSE TITLE: CODE:	CHEMICAL KINETICS CH 2240	TIME ALLOWED: 2H
DATE: JUNE 7, 2017	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	

Answer the following questions (25 marks for each)

Question No., 1

I) **Choose the correct answer :** (15 marks 3 for each)

- 1) The unit of second order rate constant is
 a) s^{-1} b) $L \cdot mole^{-1} \cdot s^{-1}$ c) $L^2 \cdot mole^{-2} \cdot s^{-2}$ d) Unitless
- 2) The half life time of all orders is proportional to
 a) a^{1-n} b) a^{n-1}
 c) $(a-x)^{n-1}$ d) a^n
- 3) The integrated rate equation for the reaction $A + B \xrightarrow{\text{slow}} \text{product}$ is.....
 a) $\frac{1}{a-b} \ln \frac{a(b-x)}{b(a-x)} = kt$ b) $\frac{1}{b-a} \ln \frac{a(b-x)}{b(a-x)} = kt$
 c) $\frac{1}{b-a} \ln \frac{b(a-x)}{a(b-x)} = kt$ d) $\frac{1}{a-b} \ln \frac{a(b-x)}{b(a-2x)} = kt$
- 4) In the pseudo-order reaction,
 a) Concentration of one reactant is very large compared to the other.
 b) Concentration of one reactant is very small and can be neglected.
 c) Concentrations of all reactants are equal.
 d) a and b are correct
- 5) The rate constant of a reaction is independent on the initial concentration for:
 a) Zero order b) First order
 c) Second order d) Third order

II) The following results were obtained in the reduction of nitric oxide with H_2



$$p_0 = 340.5 \text{ mm Hg} \quad \text{at} \quad t_{1/2} = 102 \text{ s}$$

$$p_0 = 288 \text{ mm Hg} \quad \text{at} \quad t'_{1/2} = 140 \text{ s}$$

Determine the order of the reaction.

(10 marks)

Question No., 2

- I) What is the difference between a simple reaction and a complex reaction? (5 marks)
- II) It was found that the concentration of N_2O_5 in liquid bromine varied with time as follows: (20 marks)

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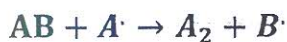
t(s)	0	200	400	600	1000
N_2O_5 (mole/L)	0.11	0.073	0.048	0.032	0.014

- a) Confirm graphically that the reaction is first order.
 b) Determine the rate constant and $t_{3/4}$.

Question No., 3

I) Define the steps of the chain reaction. (5 marks)

II) a) Rearrange the following equations according to the steps of chain reaction for the reaction ($A_2 + B_2 \rightarrow 2AB$) (10 marks)



- b) Write the rate equations of the formation and disappearance of $[A \cdot]$, $[B \cdot]$ and $[AB]$. (10 marks)

Question No., 4

I) The reaction mechanism



Involves an intermediate I. Prove that $\frac{d[P]}{dt} = \frac{k_a k_b}{k'_a} [A][B]$. (10 marks)

II) The rate of the reaction $A + 3B \rightarrow C + 2D$ was reported as 1.0 mole/L.s. state the rate of formation and consumption of the participants. (5 marks)


III) What is the Arrhenius equation, Activation energy and collision number? (10marks)

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Good luck

Examiners: Prof. Dr. Youssry El-Sheikh
Dr. Nagla Oraiby

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR LEVEL TWO OF STUDENTS OF CHEMISTRY/BIOCHEMISTRY			
	COURSE TITLE:	PRINCIPLE OF BIOCHEMISTRY II	COURSE CODE: BC2204	
DATE:	14-6-2017	TERM: SECOND	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the entire following question:

I- Clarify briefly each of the following:

(35 marks)

- 1- Main different composition of intracellular and extracellular fluids
- 2- Diabetes insipidus
- 1- Ascites
- 6- Blood buffer
- 8- Water intoxication
- 10- Acidosis
- 3- Addison's disease
- 5- Overhydration
- 7- Serous Fluid
- 9- Causes of dehydration

II- Illustrate diagrammatically to be clarifying each of the following (12 marks)

- 1- Transport of CO_2 from tissue to red blood cells and transport of O_2 from hemoglobin to tissue.
- 2- Mechanism of reabsorption of sodium from kidney when blood pressure decrease

III- 1- The molecular mass of phospholipid, lipopolysaccharides and proteins are 1000, 500 and 60,000 respectively. The weight ratios of protein to total lipid in plasma membrane are equal. The weight ratios of phospholipid, lipopolysaccharides are also equal. Suppose that total lipids are phospholipids and lipoprotein. Calculate the molar ratios of three components.

(6 marks)

2- The specific volume of ammonium sulfate is 0.565 ml/g. The solubility of ammonium sulfate is 706 g/1000g water (100% saturated solution). Molecular mass of ammonium sulfate is 132.

a- What are (1) The molarity, (2) molality and (3) ismolarity of saturated and 60% ammonium sulfate?

b- What is the amount of ammonium sulfate present in 200 ml 60% saturated?

(12 marks)

3- 100 mg of Evan Blue was dissolved in 5 ml distilled water and injected intravenous to person. The volume of urine was 500 ml after 6 hours and the concentration of Evan Blue were 80 mg/L in urine and 0.015 mg/ml in plasma. The hematocrit was 40%. Calculate the total amount of blood. Mention the criteria of substance that injected to be measure intravascular.

(10 marks)

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1. Consider the following peptide:

(10 marks)

A-L-K-M-P-E-Y-I-S-T-D-Q-S-N-W-H-H-R

Indicate the fragments generated after the following digestions:

a) trypsin

b) pepsin

2. What amino acids among the following would you expect to find a) inside, and b) at the surface of a typical globular protein in an aqueous solution of pH 7? (10 marks)

Glu Arg Val
Phe Ileu Asn
Lys Ser Thr

3. You wish to determine the sequence of a short peptide. Cleavage with trypsin yields three smaller peptides with the sequences Leu-Glu, Gly-Tyr-Asn-Arg, and Gln-Ala-Phe-Val-Lys. Cleavage with chymotrypsin yields three peptides with the sequences Gln-Ala-Phe, Asn-Arg-Leu-Glu, and Val-Lys-Gly-Tyr. What is the sequence of the intact peptide? (10 marks)

4. Draw the structure of the following peptide GWYQR. (10 marks)

5. What is the net charge (+, 0, -) of the amino acids glycine, serine, aspartic acid, glutamine and arginine at: (20 marks)

a) pH 2.01

b) pH 3.96

c) pH 5.68

d) pH 10.76

Glycine (pI: 5.97)

Serine (pI: 5.68)

Aspartic Acid (pI: 2.77)

Glutamine (pI: 5.65)

Arginine (pI: 10.76)


6. What is the objective of Xanthoproteic test? (5 marks)

7. How can you differentiate between tyrosine and tryptophane? (5 marks)

8. What are the biological functions of proteins. (5 marks)

GOOD LUCK

EXAMINERS	PROF. DR. EHAB M.M.ALI
	DR. THORIA A. AZIZ

	TANTA UNIVERSITY FACULTY OF SCIENCE			
	DEPARTMENT OF BOTANY			
	EXAMINATION FOR SOPHOMORES (CHEMISTRY- BIOCHEMISTRY AND SPECIAL BIOCHEMISTRY)			
COURSE TITLE:	General microbiology		COURSE CODE: MB 2240	
DATE: 24-5-2017	JUNE 2017	TERM: SECOND	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following questions

First Part: Mycology Marks: 75

1-Complete the following sentences (write the whole sentence): (24 Marks)

- a- Class: discomycetes divided into three orders: order:likegenus.....; order....like genus..... and order.....like genus.....
- b- Sub-division basidiomycetes divided into three classes ; class, classand class
- c-Orders prenosporales divided into three families: family like genus....., family like genus.....and family like genus.....

2-Explain briefly and drawing life cycle of *Claviceps purpurea* (21 Marks)

3- With label diagram draw only three genera from family Erysiphaceae (sexual and asexual) (15 Marks)

4- Draw and write stages of puccinia graminis on barberry plant only (15 Marks)

Second Part: Bacteriology Marks: 75

1-Complete the following: (20 marks)

- a-Cell mass of bacteria detected by ;
- c- Bacteria grow in batch culture and revealed the following stages.....
- d- Chemostate characterized by
- e- leading strand identified as
- f- origin of DNA replication in bacteria called.....

2-Compare between the following: (20 marks)

- a- Cell wall structure of Gram +ve and Gram -ve bacteria
- b- Pilli and flagella

3- Identify the following: (20marks)


antibiotics, mutation, swimming movement, transformation

4- Discuss different applications of bacteria in our life (15 marks)

Best wishes

Examiners: Prof.Dr.Susan Assawah, Dr. Nanis G. Allam



	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS		
	EXAMINATION FOR SOPHOMORES (2 ND LEVEL) STUDENTS OF BIOCHEMISTRY & CHEMISTRY/ BIOCHEMISTRY		
COURSE TITLE:	BIOPHYSICS		COURSE CODE:PH2292
DATE:	27=5-2017	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50
			TIME ALLOWED: 2 HOURS

ANSWER THE FOLLWING QUSTIONS:

1- Write on: (12 mark)

- a) Radiations effects on living tissues, and
- b) GM counters applications.

2- Explain: (12 mark)

- a) Transitions of molecules,
- b) Bioelectrical Potentials and an application.

3- Discuss: (12 mark)

- a) An application of sound forces,
- c) The effect of magnetic fields on human cells,

4- Write on:-

- (a) The applications of radioactive materials in medicine. (14 mark)
- b) The Hearing theory.

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EXAMINERS: Prof.Dr. G. FARAG & Prof. Dr. F. El Hussiny