المستوى الثانى

كيمياء /علم الحشرات

1969	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY			
	EXAMINATION FOR SOPHOMOR (SECOND YEAR) STUDENTS OF ENTOMOLOGY / CHEMISTRY			
	COURSE TITLE	INSECT INTERRELATIONSHIPS WITH OTHER LIVING ORGANISMS		COURSE CODE: EN 2242
DATE:	JUNE, 2017	TERM: SECOND	TOTAL ASSESSMENT MARKS:150	TIME ALLOWED: 2 HOURS

PLEASE NOTE THE EXAM IN Three (3) PAGES

ANSWER THE FOLLOWING QUESTIONS:

The First Question..... (45 Marks)

A. Indicate whether the following statements are true or false. Correct the false one .....(20 Marks, 2 Each)

1) Cannibalism is a very widespread habit among insects.
2) Some ants are social insects living in large colonies.
3) The male stink bug guards not only the eggs but also the first nymph instars until they become second instars.
4) The female chrysomelid beetle, *Acromis sparsa*, just lay eggs and do not care.
5) Stable fly that transmits anthrax among horses and cattle.
6) Cyclo-propagative biological transmission of pathogens by insect vectors means no multiplication but cyclic changes.
7) Tachinid flies are predators of many Lepidoptera larvae.
8) The large blue butterfly is the only insect that makes regular transoceanic migration.
9) In termite colony, the whole work of the colony is carried by the soldiers.
10) Termitophiles are beetle guests found in ant nests.

B. Fill in the blanks with the appropriate words.....(20 Marks, 2 Each)

1) Human extreme manifestation of fear of insects is termed.....
2) The members of order..... contain cantharadin, which results in blistering of human skin.
3) The saliva of piercing sucking mouth parts causes a toxic reaction in the fruit resulted in ..... causing ..... to the grower.
4) The plum curculio make a ..... in the apple.
5) .....and.....are major types of chewing insects.
6) The human filarial worm ..... transmitted by the black flies can cause blindness.
7) The migratory locust, *Schistocera gregaria* has two different phases.....and.....
8) ..... remain by day motionless on the trunk of a tree .
9) The simplified model of termite life cycle indicates three castes.....,.....and.....
10) Plague is essentially a disease of rodents and transmitted by.....

C. Choose from between the brackets the correct answer..... (5 Marks, 1 Each)

1) **(bee wax – royal jelly – bee venom)** is used in rheumatoid arthritic treatment
2) Urticating hairs are on the integument of **(beetles---caterpillars-----ants).**
3) **(lice – flea – black fly)** are the most typical of insect ectoparasites that remain in permanent contact with man.
4) The larvae of **(*Gastrophilus* - *Haematopinus* - *Hypoderma*)** burrow in the skin of the back of cattle. Tumors under the skin are formed.
5) Female **(ear wig--- stink bug---*Acromis sparsa*)** stays with her offspring until they reach adulthood.

The Second Question..... (Total 30 Marks)

A. State whether the following sentences are true or false with correction..... (10 Marks, 2 Each)

1) The female yucca moth deposits her eggs in the ovary of the flower; the larvae feed upon fertilized seeds.
2) Oligophgous insects feed upon an unlimited number of plant species.
3) Aphids can transmit viruses to plants only by mechanical transmission.
4) Galls caused by insects constitute pathological conditions caused by toxicogenic insects.
5) Black and yellow molds of corn are bacterial diseases transmitted to plants.

B. Fill in the blanks with the appropriate words..... (10 marks, 1 Mark for each blank)

1) In *Drosophyllum* sp., insects are attracted to .....alight upon stems, become entangled in this sticky fluid, and cannot escape.
2) .....plants are those pollinated by insects
3) The relationship between acacia plant and ants is known as.....
4) Phytophagous insects feed on .....and .....
5) Entomophagous plants grow mainly in soils poor in nutrients specially .....
6) ..... tend to be showy and smelly, with very characteristic shapes, and often possess nectarines.
7) The siphoning or lapping mouth parts of insects that feed on nectar are well-known adaptations, e.g. .....
8) Insects influence the development of plant diseases by direct production of disease,.....or .....

C. Choose the correct answers in the following..... (10 Marks, 2 Each)

1) Plants and insects may have **(harmful – beneficial – both)** relationships.
2) The relationships between insects and plants dated back to **(Devonian – carboniferous – Cambrian)** age.
3) The bladderwort is carnivorous plant grown in open **(air – water – desert)** near the edges of lakes.
4) Some insects suck the sap from the living cells, e.g. **(aphids – bees – grasshoppers)**.
5) The pitcher plant is the common name of **(*Drosophyllum* – *Nepenthes* – *Dionaea*)**.
6) The insect victim is digested in by most pitcher plants by secreting enzymes such as **(pepsin – lipase-chitinase)**.
7) **(Bee – Beetle – Moth)** pollinated flowers are either very large or cup–shaped like the magnolia, or have tight aggregations.
8) Insects are one of the principal agents of **(cross – self)** -pollination, because it has increased the frequency of hybridization and variations.
9) **(Ecto – Endo)** -symbiosis is the condition when the organism is harbored within the other body.
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The Third Question..... (Total 38 Marks)

A. In view of your study, shortly discuss giving examples whenever possible, the fungi pathogenic to insects and their use in biological control ....(10 Marks)

B. In details explain the insect-borne viruses of human ..... (10 Marks)

C. In only one sentence, define each of the following terms..... (6 Marks, 2 Marks each)

a) Grasserie disease of the silk worm. b) Brown rot of apples c) Tularaemia

D. Fill in the blanks.....(12 Marks, 1 Mark for each blank)

1) Epidemic typhus is caused by ..... and is transmitted by .....
2) The viruses transmitted mechanically to plants are called ..... viruses
3) Milky disease of Japanese beetle larvae is ..... disease
4) Fire blight disease of apples and pears is caused by the bacterium ..... which becomes active and multiplies forming .....
5) Transmission of the bacterium causing the European foulbrood disease of the honey bee occurs through ....., ..., and .....

6) The vectors of bacterial will of cucurbits are: ..... and .....

7) An eruptive rash or purplish spotting of the human skin and microscopic nodules around arterioles are characteristic features of ..... disease

The Fourth Question..... (Total 37 Marks)

A. Indicate whether the following statement is true or false ..... (10 Marks, 2 Each)

1) Most entomopathogenic protozoa have low virulence and cause a chronic infection that often does not kill an insect.
2) The majority of insect flagellates occur in the digestive tracts and others in the Malpighian tubules.
3) Penetration through the integument occurs in the amoeba *Malpighamoeba mellificae* through invasion cysts attached to the cuticle.
4) *Blastocrithidia triatomae* is promising candidate for microbial control of triatomines, the vector of human Chagus disease caused by *Trypanosome cruzi*, because of its pathogenicity and capacity to form high resistant cysts in vitro.
5) Microsporidian spores are the only stage that can exist inside a living host cell.

B. Choose between the brackets the correct answer.....(10 Marks, 2 Each)

1) *B. triatomae* cause **(destruction of gut and appendages- disturbances in excretion, digestion and sclerotization – dysfunction of salivary gland and haemocoel)** to its triatomine host
2) *Blastocrithidia caliroae* infects all larval stages of the pear slug, *Calioa cerasi*, except **(adult- first instar-pupa)**.
3) *L. dononani*, the cause of Indian Kala-azar **(may completely block the lumen of the pharynx of a heavily infected fly – ulceration of gut – change the blood picture)**.
4) Most insect-associated amoeba species are found in **(salivary glands- digestive tracts- cuticles)** of their hosts.
5) This ciliate *Lamborella clarki* is unique in that it has the ability to penetrate the **(gut- cuticle- anus)**

C. Fill in the blanks with appropriate words..... (7 Marks, 1 Mark for each blank)

1) The enormous number of the protozoan spores in the fat, midgut, or hemolymph may cause these structures to .....
2) Most insect-associated amoeba species are ....in digestive tracts of their hosts.
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4) Entomopathogenic nematodes carry within their bodies .....
5) The massive number of trophonts of *Lamborella clarki* causes larvae to become .....and .....
6) The pathologies caused by microsporidia range from chronic diseases causing ..... to acute diseases that kill the insect host.

D. Give short notes on..... .....(10 Marks, 2 Each)

1) Mutualism between termites and flagellates.
2) Life cycle of insect pathogenic nematodes.

GOOD LUCK

EXAMINERS	PROF. IBRAHIM BAKR HELAL	PROF. SAID NOR EL-DEEN
	DR. EMAN ELHUSSEINY	DR. WESAM MEHRIF

1969	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY			
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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]**

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

Question (2):

A. Answer the following: **[20 marks]**

1. Illustrate with drawing the "Jablonisky 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 Glober 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**

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**

1969	TANTA UNIVERSITY FACULTY OF SCIENCE CHEMISTRY DEPARTMENT		
	FINAL EXAM FOR 2nd LEVEL STUDENTS		
	COURSE TITLE: CHEMICAL KINETICS CODE: 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. $mole^{-1}.s^{-1}$. c) $L^2.\ mole^{-2}.s^{-2}$ 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 $\xrightarrow{slow}$ 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

$$(2NO + H_2 \rightarrow N_2 + 2H_2O)$$

p_o = 340.5 mm Hg at $t_{1/2} = 102\ s$

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

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($\boldsymbol{A_2 + B_2 \rightarrow 2AB}$) **(10 marks)**

$\boldsymbol{A^{\cdot} + B_2 \rightarrow AB + B^{\cdot}}$

$\boldsymbol{B^{\cdot} + B^{\cdot} \rightarrow B_2}$

$\boldsymbol{B^{\cdot} + A_2 \rightarrow AB + A^{\cdot}}$

$\boldsymbol{B_2 \rightarrow B^{\cdot} + B^{\cdot}}$

$\boldsymbol{AB + A^{\cdot} \rightarrow A_2 + B^{\cdot}}$

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

$$\boldsymbol{A + B \underset{k_a}{\overset{k_a}{\rightleftharpoons}} I}$$

$$\boldsymbol{I \xrightarrow{k_b} P, \quad k_b \ll k'_a}$$

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 $\boldsymbol{A + 3B \rightarrow C + 2D}$ 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)**

.....

Good luck

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

	TANTA UNIVERSITY FACULTY OF SCIENCE ZOOLOGY DEPARTMENT		
	Exam For The 2nd Year Students Of Chemistry & Entomology		
	Course title:	Insect Ecology (الأسئلة فى صفحتين)	Course code: EN 2244
Date: 24 / 5 / 2017	Term: Second	Degrees: 150 marks	Time allowed: 2 hours

Answer the following questions:

1. Fill in the blanks with the appropriate words (18 marks, 2 each):

A. For any ecological problem, the solution will be by the end of 4-step process: description, understanding, ... and .....
B. The fittest individuals tend to ..... and reproduce better.
C. Much of the deviation among populations isolated on islands appears to be due to.....
D. Biomes are recognized with differences in.....of different parts of the world.
E. Polyphenism of the European butterfly, *A. levana*, is known to be due to different.....
F. Terrestrial insects reduce water loss by reducing the size of.....
G. .....is the transference of adults of a new generation from one breeding habitat to others.
H. Ecotype is defined as .....

2. State whether the following statements are true or false with correction (20 marks, 2 each):

A. Insets, as poikilothermic animals, maintain a constant body temperature irrespective to the temperature of the surroundings.
B. Deserts are the most productive of the Earth's biomes.
C. Circadian rhythms are endogenous, but are regulated by environmental factors.
D. Salt-water inhabiting insects have a mechanism for removing excess water that enters the body in saline medium.
E. Juvenile hormone (JH) plays a major part in the initiation of migratory behavior.
F. Conservation is the degree of variation of life forms within a given ecosystem.
G. The frequency of melanic form in the peppered moth fell to near pre-industrial levels due to the intensive use of charcoal.
H. Evolution by natural selection state that the individuals that make up a population of a species are not identical.
I. Light exerts an immediate effect on the orientation of an insect in food search
J. Within limits (upper and lower lethal limits), metabolic rate is inversely proportional to ambient temperature

3. Choose the correct answer for each statement (16 marks, 2 each):

A. Synchronized eclosion increases the chances to (find a mate and food - escape potential predators - all of these).
B. Cold hardiness refers to an insect's ability to adapt to and survive (low - high – moderate) temperature.
C. Polymorphism is the occurrence of more than two (discontinuous – continuous) phenotypes of a species together.
D. Egypt's climate belongs to (Chaparra – Taiga – Desert).
E. Molecular studies using *Drosophila* mutants have identified 10 genes involved in (seasonal – circadian – annual) rhythms.
F. Freezing (susceptible – tolerant) insects have body fluids with lower freezing point and may undergo supercooling.

G. The environmental stimuli that induce (diapause – migration – cold hardness) must exert their influence at an earlier stage in development.

H. The organisms that breed together in nature to produce fertile offspring must be (similar – different – isolated).

4. (20 marks, 10 each)

A. Write short notes on the geographic modes of speciation in nature.

B. Define the categories of migration in insects and discuss on of them.

5. Choose the correct answer (36 marks)

A. Similar ..... are often shared by organisms inhabiting a common habitat
(a)characters (b) adaptations (c) populations.

B. The ability to use water produced in the metabolic processes, makes it possible for some species to live on .....
(a) very dry food (b) variety of food (c) large amounts of fluids

C. Females of *Perilitus coccinella* a parasitoids of various lady beetles use their.....to locate their host.
a) vision (b) mandibles (c) antenna

D. Organisms near to the .....have better chance of obtaining food.
(a) Third trophic level (b) 2nd trophic level (c) 1st trophic level

E. Normally, inset's populations occur in low enough densities as to avoid .....
(a) predation (b) exclusively plant eaters (c) competition

F. Maximum.....is the longest period of life reached by a given type of organisms.
(a) Fecundity (b) Longevity (c) Life span

G. In the equation describing population growth K indicates the .....
(a) intrinsic rate of increase. (b) carrying capacity (c) death rate.

H. In the nitrogen cycle, the transformation of gaseous nitrogen into nitrogen- containing compounds is performed primarily by.....
(a) bacteria (b) green plants (c) herbivores

I. The main driving force for the water cycle is the .....on the earth's surface.
(a) evaporation (b) precipitation (c) sunlight

J. In ..... immature stages produce a progeny without fertilization.
(a) Parthenogensis (b) Paedogenesis (c) Homogenises

K. ..... Caused by living organisms tend to be density dependent.
(a) Abiotic factors (b) population growth (c) Biotic factors

L. The study of the interrelationships of living organisms and their environment is.....
(a) Ecology (b) population (c) community

6. (40 marks):

A. Write short notes on:

- Factors that affect population growth. (10 marks)
- Population crash. (6 marks)
- Defensive chemicals in the ground beetle *Blpas sulcata*. (7marks)
- The biological fixation process in nitrogen cycle. 7 marks)

B. Differentiate between r- selected species and k- selected species?(10 marks)

Examiner: Prof. Dr/ Ensaf El-Gayar **Dr/ Wesam Meshrif**

	TANTA UNIVERSITY FACULTY OF SCIENCE ZOOLOGY DEPARTMENT		
	Exam For The 2nd Year Students Of Chemistry & Entomology		
	Course title:	Insect Ecology (الأسئلة فى صفحتين)	Course code: EN 2244
Date: 24 / 5 / 2017	Term: Second	Degrees: 150 marks	Time allowed: 2 hours

Answer the following questions:

1. Fill in the blanks with the appropriate words (18 marks, 2 each):

A. For any ecological problem, the solution will be by the end of 4-step process: description, understanding, ... and .....
B. The fittest individuals tend to ..... and reproduce better.
C. Much of the deviation among populations isolated on islands appears to be due to.....
D. Biomes are recognized with differences in.....of different parts of the world.
E. Polyphenism of the European butterfly, *A. levana*, is known to be due to different.....
F. Terrestrial insects reduce water loss by reducing the size of.....
G. .....is the transference of adults of a new generation from one breeding habitat to others.
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Examiner: Prof. Dr/ Ensaf El-Gayar **Dr/ Wesam Meshrif**

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FORLEVEL TWO OF STUDENTS OF CHEMISTRY/BIOCHEMISTRY			
	COURSE TITLE:	PRINCIPLE OF BIOCHEMISTRY II		COURSE CODE: BC2204
DATE:	١٩-6- 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 inspidus
3- Addison's disease
1- Ascites
5- Overhyderation
6- Blood buffer
7- Serous Fluid
8- Water intoxication
9- Causes of dehydration
10- Acidosis

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)**

See The Next Page

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 withchymotrypsin 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