	جامعة طنطا كلية العلوم قسم الفيزياء	
	امتحان لطلبة كلية العلوم الشعبة : فيزياء حيوى	
	الفرقة الثالثة	كود المقرر : **Bp3164**
	Date: Feb. 2021	الزمن : ساعتان

Answer the following questions:

First question (25 deg.)

a. Define: repolarization, active membrane, refractory period, action potential, sodium current.

b. How can you convert passive membrane to active membrane?

Second question (25 deg.)

a. What are the conditions of steady-state in nervous cells

b. Write down about the membrane properties and ion channel.

Third question (25 deg.)

a. Compare between active and passive membrane.

b. true or false:

1. The action potential has a character of all or none,
2. Nervous system in human body needs special circumstances to be fine.

c. Discuss Hodgkin and Huxley model for active membrane.

Fourth Question (25 deg.)

a. Mathematically find the chemical **(Fick's law)** and electrical **(Ohm's law)** gradient of the cell membrane.

b. Write down about the applications result from studying nervous system in biophysics and how can you save your nervous system?

WITH MY BEST WISHES

	TANTA UNIVERSITY FACULTY OF SCIENCES DEPARTMENT OF PHYSICS			
	EXAMINER:	PROF. DR. RIYAD A.M. GHAZY		
	COURSE TITLE:	molecular biophysics01		COURSE CODE:BP3112
DATE:	21/3/2021	TERM: 1ST	TOTAL ASSESSMENT MARKS:200	PERIOD: 2 HES

Answer the following -

1- A: Write-down the kinds of physical models of molecules?

B: Measurements of the far-infrared absorption bands of the Hcl molecule allow direct access to the pure rotational transitions. Some of the obtained results are as follows:

ΔE=83.32 cm^{-1} for the J=3→4 transition;

ΔE=104.13 cm^{-1} for the J=4→5 transition; and

ΔE=83.32 cm^{-1} for the J=5→6 transition.

#: Verify the consistency of the measurements and obtain the rotional constant B for the Hcl molecule:

##: Calculate the inter-nuclear distance of the molecule(m_H=1.0m_u; m_{cl}=35.5m_u; and m_u=1.67E-27 Kg); and

###: Explain the obtained result for the rotational constant B.

2- A: Write-down the state of Fick's law for diffusion and its different formulas?

B: The observed vibrational frequency of iodine,I_2, molecule is $v=\omega_e$=213.0cm^{-1}. Knowing the mass of each iodine atom(m=21.08E-26Kg),

#: Name the kind to which that molecule belongs?

##: calculate the elastic constant of the molecule?

3- A: Explain the diffusion phenomena showing the role of diffusion constant D, frictional coefficient f, molecular radius r, molecular mass M, and time of diffusion t? Give a numerical example?

B: "Electrical current in cells and organisms is not carried by electrons." Explain showing the following: Ohm's law, conductivity, molar conductance, Kohlrausch law, electrophoretic mobility, and molar conductance.

4- Explain the diffusional flow across cell membranes without source ***OR*** with source(***Only one case***)?

EnD

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS (FACULTY OF SCIENCE)		
	EXAMINATION FOR THIRD YEAR STUDENTS OF BIOPHYSICS (متطلب تخرج)		
COURSE TITLE:	SIMULATED ELECTRONICS OF THE BIOLOGICAL SYSTEMS		COURSE CODE: PB3258
DATE: 29	DECEMBER, 2020	TERM: SECOND	TOTAL ASSESSMENT MARKS:50	FINAL EXAM.

Answer The Following:

1- (20 points) First Question:

a. (10 points) Define [Oxygen Saturation – Electrodermal Activity]

b. (10 points) What is the difference between the operation of [Cardiac Pacemakers – Cardiac Defibrillators]

2- (10 points) Second Question:

Explain the circuit part that performs the following jobs:

a. The respiration Rate.

b. Linear Variable Differential Transducer.

3- (10 points) Third Question:

a. Using the graphical illustration, Explain the heart anatomy and the sequence of electrical actions that generates the ElectroCardioGram signal.

b. Using Block diagram, explain the basic parts of medical instrumentation signal.

4- (10 points) Third Question:

a. Warburg had set a model of RC equivalent for the skin-electrolyte interface. Explain Warburg model.

b. Using Operational Amplifiers, Draw the circuit used in integration processes.