جامعة المنصورة – كلية العلوم
قسم الرياضيات
التاريخ : ٢٥ / ١٢ / ٢٠١٢ م
الدرجة الكلية : ٨٠
الزمن : ساعتان

امتحان دور يناير ٢٠١٣م
برنامج : *
المستوى:الثالث
اسم المقرر : احصاء حيوى
كود المادة : ر ٣٠١

Answer the following questions:

[1] a- A random sample of 100 patients is selected and treated by a new drug for AIDS. After 8 weeks, 20 of them show signs of improvement. Find a 99 % confidence interval for the true proportion of all patients treated by this new drug and show improvement after 8 weeks. (10 Marks)

b- Suppose that in a certain city , the probability that a man has high blood pressure is 0.18 If we randomly select 10 men from this city .

i) Find the probability that exactly 3 men have high blood pressure

ii) Find the expected number of men with high pressure (10 Marks)

[2] a- A Coin is tossed 4 times , let X denotes the number of heads occurs . Find

i) $P(X=3)$ ii) $E(X)$ iii) $Var(X)$ (10 Marks)

b- A sample of size 64 is drawn from a population with $\mu = 3.2$ and a standard deviation $\sigma = 1.6$. Find the Probability that the sample mean will be

i) more than 3.5 ii) less than 2.7 (10 Marks)

c- In a certain population, suppose that the number of deaths per year from cancer has a Poisson distribution with average 6 Find the probability that in a year there are

i) Exactly 4 deaths ii) Less than or equal two deaths (10 Marks)

[3] The following table shows the age distribution (in years) of 76 patients who complained of flu. (30 Marks)

Age	5.5 – 10.5	10.5 – 15.5	15.5 – 20.5	20.5 – 25.5	25.5 – 30.5	30.5 – 35.5
frequency	6	10	20	22	13	5

Find i) The sample Mode ii) The sample median iii) The sample variance

$\varphi(1.5) = 0.933$, $\varphi(-2.5) = 0.0062$, $t_{(0.025,8)} = 2.306$, $t_{(0.025,9)} = 2.262$

$Z_{0.005} = 2.58$, $Z_{0.025} = 1.96$

* برامج : كيمياء و حيوان - فيزياء حيوى - ميكروبيولوجى – كيمياء ونبات – علوم البيئة

مع أطيب التمنيات بالنجاح د. فاتن شيحه – د. نورا فخرى

Mansoura University Faculty of Science Botany Department	Final Examination in Biology **Applied Microbiology** (320 ف)	
31 – 12 - 2012	3rd Level – Biophysics Program	Time : 2 hrs
Full mark: 60	First Term	Question mark: 15

Q1. A. Comment on algae as vegetables and as fertilizers. **(6 marks)**

B. Choose an algal industry. Explain how can you get the product from the seaweed? What is it used for? **(8 marks)**

C. Explain the role of microalgae in sewage treatment. **(6 marks)**

Q2. A. Explain in details why is ***Spirulina*** consider as a superfood? **(5 marks)**

B. Comment on medicinal uses of marine algae. **(5 marks)**

C. Explain with illustrations types of microbial cultures. **(5 marks)**

D. If one starts with 10^2 cells in a culture that has a generation time of 2h, how many cells will be in the culture after 4, 24 & 48h? **(5 marks)**

Q3. Discuss the role of microorganisms in each of the following:

A. Recovery of metals **(4 marks)**

B. Biofertilizers **(4 marks)**

C. Biotransformations **(4 marks)**

D. Single cell protein **(4 marks)**

E. Acetone-butanol production by microorganisms **(4 marks)**

Examiners:

Prof. Yehia A. Azab

Ass. Prof. Mervat H. Hussein

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Chemistry** **Course(s): Chem. 315.**		**First Term** **Third Level Biophysical Students** **Time Allowed: 2 hours** **Full Mark: 60 Marks** **Date:** Jan. 2013

Answer The Following Questions

1. A) Derive a curve for the titration of 50.0 ml of 0.1 M NaCl with 0.1M $AgNO_3$, calculate PCl of the solution after the addition of 0.0,10.0,49.0,50.0 and 60.0 ml of 0.1M $AgNO_3$, prepare a titration curve from the data ($KspAgCl=10^{-10}$) **(12 Marks)**

B) Mention the requirements for a primary standard material. **(6 Marks)**

2. a) Define the following (mention example and low if present **(16 Marks)**

1. Pricision
2- Rejection of a result (Q test)
3. Common ion effect
4. Co- precipitation
5. Oxidation – reduction titration.
6. Buffer solution
7. Moher method
8. Plan of analysis

b) Explain the use of adsoption indicator (Fajans method) for priciptation titration. **(6 Marks)**

c) Explain and draw hydrogen electrode **(6 Marks)**

3. a) Mention the requirements for successful gravimetric method. **(6 Marks)**

b) Explain the behaviour and color range of acid base indicator **(8 Marks)**

With Best Wishes,

Dr. W. Abo El-Matty

المستوى الثالث - فيزياء حيوية - فيزياء الجوامد ف ٣١١

Mansoura University Faculty of Science Department of Physics Course Code: Phys. 311 Title: Solid State Physics		First Semester (Jan. 2013) Exam Type (Final): 3rd Year (Physics, Biophysics) Time: Two Hours Full Mark: 80 Mark

Answer **the first one and any other two questions** from the following

1- a: Show that the bulk properties of a solid does not depend on its volume . [13 Mark]

b: Illustrate with drawings the planes in an orthorhombic crystal whose Miller indices are (101), (201), (123). [13 Mark]

2- a: Derive a relation for the spacing between planes in a crystalline structure. [14 Mark]

b: Copper has fcc structure, its density is 8.93 g/cm^3 and its atomic weight is 63.5 g/atom. Calculate:

(*i*) Number of atoms per mm^2 in the (101) plane,

(*ii*) The radius of Cu atom. (N_A =6.022×10^{23} mol^{-1}) [13 Mark]

3- a: Proof that Brag condition for diffraction is consistent with Laue equations. [14 Mark]

b: Explain how the spacing (*d*) between parallel planes in a crystal can be determined experimentally. [13 Mark]

4- a: Write on the effect of lattice imperfections on the physical properties of crystalline materials. [14 Mark]

b: Compare between the packing fractions of SC, BCC, FCC cubic lattices. [13 Mark]

مع التمنيات بالتوفيق: أ.د. حمدى دويدار

المستوى الثالث. فيزيا حيوية - ف ح ٢١١ فيزيا حيوية جزيئية

Mansoura University
Faculty of Science
Zoology Department
El- Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم علم الحيوان
المنصورة - مصر

First Semester, Jan. 2013

Academic year: 3rd Level
Time: 2hr
Date: 14/01/2013

Program: Biophysics
Subject:MolecularBiophysic
Course :Ph,Z 311
Full Mark: 80

Answer All The Following Questions:

1. Write short notes on the following: ***20 Mark***

A: Transport Mechanisms of Membranes.

B: Membrane Structure and Function.

2. What do you know about the biological molecules: ***20 Mark***

A: Carbohydrates.

B: Proteins.

3. Discuss: ***20 Mark***

A: Nuclear Magnetic resonance (NMR).

B: X-Ray Crystallography.

4. Write on the: ***20 Mark***

A: Computational biology.

B: Quantitative Fluorescence Microscopy.

With My Best Whishes.....

.....Dr. Sayed Kamel

المستوى الثالث - فيزياء حيوية . فيزياء حيوية اشعاعية فص ٢١٠

Mansoura University Faculty of Science Physics Department		3rd Level students Biophysics Full Mark: 80 Marks Allowed time: 2 hour Course title: Radiation biophysics
Course code: biophys 310.	Date: 21...../1.../2012	

Answer all the following questions:

1-Complete the following decay processes by adding the missing decay particles $(\alpha, \beta, \gamma, \nu)$

(a) ${}^{11}_{6}C \rightarrow {}^{11}_{5}B + ?$ **[5 Marks]**

(b) ${}^{32}_{15}P \rightarrow {}^{32}_{16}S + ?$ **[5 Marks]**

(c) ${}^{12}_{6}C^{*} \rightarrow {}^{12}_{16}C + ?$ **[5 Marks]**

(d) ${}^{240}_{94}PU \rightarrow {}^{236}_{92}U + ?$ **[5 Marks]**

(e) An excited nucleus decays, emitting a 2-MeV gamma ray. Find the frequency and wavelength of gamma ray photon emitted. **[5 Marks]**

2- (a)Mention the different types of Photon Interactions in Matter? **[5 Marks]**

(b)Differentiate between the internal conversion and Auger electron . **[5 Marks]**

(c) What do we mean by Radiosensitizer and radioreceptors. **[5 Marks]**

(d)^{59}Fe is administered to a patient to diagnose blood anomalies .Find its effective Half life (Tb =65 days , Tp = 46.3 days) **[5 Marks]**

(e)What is the activity of 1 gm of radium-226 which has a half-life of 1620 years? **[5 Marks]**

3-(a) explain the mechanisms of radiation damage to DNA . **[8 Marks]**

(b)Show the difference between particulate and electromagnetic radiation . **[4Marks]**

(c) Define the following : Radiation absorbed dose –dose equivalent– Linear energy transfer and mass decrement . **[5Marks]**

(d)Discuss the basic principle of magnetic resonance imaging (MRI) . **[8Marks]**

(e) Living tissues exposed to 10000 rad are completely destroyed . By how much will this Absorbed dose raise the temperature of the tissues if non of the heat is lost ? (assume that the specific heat of the tissue is the same as that of the water, c = 4180J $Kg^{-1}K^{-1}$). **[5Marks]**

Examiners :

1. Dr. M. Mekhemar **2. Prof. Dr. Taha Sokkar**

3. Prof. Dr. Magdy Tadros **4. Prof. Dr. A. El-khodary**

Mansoura University *Faculty of Science* *Physics Department*	**Date: Jan. 2013**	**Third Year** **Physics & Biophysics** *Time allowed: 2 hrs* *Full Mark: 80*

Course: Quantum Mechanics I Phys.(314)

Answer Four Questions Only:

1.a) Find the bound state energy levels and their corresponding eigen-functions of a particle moving in one-dimensional harmonic oscillator potential. [15 Marks]

1.b) Discuss the Degeneracy of the lowest three energy states of a spherical harmonic oscillator. [5 Marks]

2.) Using the radial part of the Schrodinger equation in spherical coordinates to determine the bound state energies of a hydrogen-like atom. [20 Marks]

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3) A particle of mass m and energy E free to move on a straight line in x-direction approaching a potential step given by $V(x)=0$ for $x<0$ and $V(x)=V_0$ for $x>$. Calculate the reflection and transmission coefficients of the particle in the case of $E>V_0$.

[12 Marks]

4.a) Using the perturbation theory for non-degenerate states to derive the first-order corrections on the energy eigenvalues and their eigenfunctions of a perturbed system.

[14 Marks]

4.b) Calculate $[\hat{E}, t]$ and $[\hat{p}_x, x^2]$. [6 Marks]

5.a) Prove that $\hat{L}_+ Y_{lm}$ and $\hat{L}_- Y_{lm}$ are eigenfunctions of $\hat{L}^2$ and $\hat{L}_z$ operators and find their eigenvalues. [10 Marks]

5.b) Determine the discrete energy levels and their corresponding eigenfunctions of a particle moving freely in an infinite deep potential. [10 Marks]

With Our Best Wishes

Prof. Dr. A.R. Degheidy Prof. Dr. A. Elhanbaly

/المستوى الثالث - فيزياء صورية - اطياف جزيئية ف ٣٢٩

Mansoura University
Faculty of Science
Physics Department

3rd Level Exam.
January 2013
Time allowed : 2 hrs

Molecular Spectroscopy (329 ف)

Answer the following questions.

1-a- Discuss the breakdown of the "Born-Oppenheimer approximation" (10 marks)

b- Explain the different regions of electromagnetic waves and the corresponding spectroscopic techniques. (10 marks)

c- Molecules can be classified into groups according to their three principal moments of inertia. (10 marks)

2-a- State and comment the microwave activity of the following molecules

H_2 – $^{12}C^{16}O$ – NaCL – CH_4 (15 marks)

b- Discuss the IR activity of the non-linear triatomic molecule H_2O. Estimate and draw the allowed fundamental modes of vibration. Explain the change in the electric dipole moment of these modes of vibration. (15 marks)

3- The vibration spectrum of a certain diatomic molecule exhibits a band origin centered at 2886 cm^{-1} and first overtone at 5668 cm^{-1}. Estimate

a-the equilibrium frequency of oscillation $\overline{\omega}_e$ (5 marks)

b-the anharmonicity constant χ_e (5 marks)

c-the zero point energy ε_0 in cm^{-1} and Joule. (5 marks)

d-the force constant k in Nm^{-1} (5 marks)

{ the reduced mass of this molecule $\mu=1.6244\times10^{-27}$ kg }

($c=3\times10^{10}$ cm/s $h=6.625\times10^{-34}$ J.s $1eV=1.6\times10^{-19}$ J $m=9.11\times10^{-28}$ g)

Best Wishes

Prof. A. El-Khodary

المستوى الثالث - فيزياء حيوية - فيزياء البوليمرات ف ٣٢٧

Mansoura University
Faculty of Science
Physics Department
Subject: Phy. 327
Physics: Polymer Physics

Academic Level: 3rd Level
Program: Biophysics
1st Term Exam 27/12/2012
Time Allow: 2 hours
Full Mark: 80 Marks

Answer (ALL) Questions:

1) What are the physical states of polymer? Discuss in details the first and the second order phase transitions in polymer. [20 Mark]

2) A- Write briefly on: [12 Mark]
- Ceiling temperature.
- Effect of temperature and pressure on polymerization.
- Electrical conductivity of polymer.

B- Define the polymerization. Explain the Ionic polymerization. [8 Mark]

3) A-Explain the physical meaning of glass-transition temperature. [6 Mark]
B-Discuss two different methods used to determine Tg [14 Mark]

4) A- Describe Differential Scanning Calorimetry. [10 Mark]
B- Write briefly on the Thermally Stimulated Current analysis. [10 Mark]

"With Good Luck"

Examiners:

1- Dr. Maysa Ismail. *2- Prof.Dr. M.Eshera.*
3- Prof.Dr. M. Abd el-Razik. *4- Prof.Dr. M. el-Tonsy.*