ف ٣١٦ ٤ قريبا, صورة منقدم

Mansoura University
Faculty of Science
Physics Department.
Subject: Physics(316)
Title: Advanced optics

Final term exam – First Term
Third level /physics
Date: Jan. 2014
Allowed Time: Two hours.
Full Mark: 80

Answer the following questions

[1] a- Discuss Raman scattering theory in a classical frame work ? [15]Mark

b- Explain, giving both theory and experimental details, how you would produce elliptically and circular polarized light? [15]Mark

[2] a-Calculate the electric field at a large distance from a thin glass plate if a source of light is placed at a large distance from its opposite side? [15] Mark

b- Write briefly about the quarter wave plate?
Calculate the thickness required for a quarter wave plate having n_o= 1.768 and n_E= 1.760 using light of wavelength λ= 5893 Å. [10] Mark

[3] a- Derive Rayleigh equation for elastic light scattering by isolated small particle in vacuum illuminated by plane polarized light? [15] Mark

b- Describe the anomalous dispersion phenomenon using Sellmeier mechanism (clarify your answer with suitable drawing)? [10] Mark

Best wishes: *Prof. Dr. Kermal El-Farahaty*

Mansoura University Faculty of Science, Physics Department	بسم الله الرحمن الرحيم **First Term Final Exam** **2014/2015** **For the 4th. Year Biophysics Students** **(Phys. 414)**	**Time Allowed : Two Hours** **Subject : Medical Ultrasonic** **Total Marks = 80 M**

Answer the following questions:

1 – Discuss the importance of using a coupling medium between the ultrasonic probes and the tested object, referring to propagation of ultrasonic waves in different media.

2 – a) Drive an expression for Doppler shift as detected by a moving receiver form stationary source.

b) If blood is flowing directly toward a 5 MHz transducer at 2 m/s, calculate the Doppler frequency.

3 – a) Explain the Piezoelectric Effect and then show how this effect could be used for construction of ultrasonic transducers.

b) A 7.5 MHz transducer detects a peak Doppler shift of 18 kHz in an artery. With a 5 MHz transducer, what expected peak Doppler shift, the same artery would be produce?

4 – Explain with drawings, principles of the immersion testing technique for solid sample contain a defect. Then show the advantages of this technique over other ultrasonic testing techniques.

With Best Wishes

Prof. Maher M. El-Tonsy

Jan. 2015

٤ فيزياء حيوية - فيزياء تجريبية حيوية فج ٤١٠

Mansoura University	First term 2014 -2015
Faculty of science	Fourth year
Physics department	Time allowed: 2 h
Subject: Experimental biophysics	Full mark: 80
Course: Biophysics	

Answer the following questions:

1. Proteins are smart molecules fulfill large specific functions depending on their structural difference, Write on the basic differences of protein molecules and show how the experimental methods that are used for biomolecules separation depends on these physical characteristics. (20)

2.a) Give the basic principles of double beam infra- red (IR), Ultraviolet (UV) spectrometers. (5)

b) Sketch the main parts of mass spectrograph and discuss how it can be used for proteins separation. (10)

c) A CO molecule in the lowest rotational energy state absorbs radiation of frequency 1.16×10^{11}Hz in transferring to the first excited state, calculate the bond length of this molecule. Atomic number of carbon 12 and Oxygen 16 and atomic mass unit $u = 1.66 \times 10^{-27} Kg$. (5)

3. a)Explain how you can measure the three types of bio-electric signals (AC noise, DC muscle potentials and cardiac signals), Showing safety precautions. (20)

b) Write on electrode –electrolyte interface, electrode half –cell potential –electrode polarization and stimulating bio electrodes. (20)

٤ فيزياء حيوي - محاكاة الكترونية للأنظمة الحيوية (ف2) (٤١١)

Mansoura University
Faculty of Science
Department of Physics

4th level Biophysics Students
Full Mark: 80
Allowed Time: 2 hours
Date: 22/1/2015

First Term Exam 2014 - 2015
(Electronic Simulation for Biological Systems)
Course code: BioPhys 411

Answer the following Questions:

Question 1:

a) Draw the current – voltage behavior of a tunnel diode, then explain the function of using it as a high frequency oscillator. (5 marks)

b) Describe the construction and operation of liquid crystal displays. (10 marks)

c) Compare between the LCD and LED devices. (5 marks)

Question 2:

a) Describe the rules must be followed in biasing a transistor. (5 marks)

b) Draw the V-I characteristic curve for JFET, and explain why the curve has this shape. (5 marks)

c) Draw the universal biasing circuit for a bipolar transistor amplifier. Explain the significance of each element in the circuit. (10 marks)

Question 3:

a) Explain the conduction mechanism of the pn junction in the forward bias, reverse bias, and breakdown voltage. (10 marks)

b) Draw a circuit for diode clamper and explain how it operates. (10 marks)

Question 4:

a) Draw and explain a circuit for a voltage doubler.

(8 marks)

b) Determine I_B, I_C and V_{CE} for the circuit of Fig. (1). Calculate the thermal stability of the circuit then comment on the result. (12 marks)

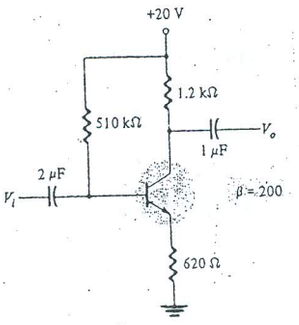

Fig. (1)

Examiners:

1) Prof. Dr. Ahmed H. Oraby

Mansoura University
Faculty of Science
Physics Department
Subject: Radiotherapy
(biophysics 412)
Physics

Second Term Exam
4st Year Biophysics Students
Date:13 Jan /2015
Time Allowed: 2 hours

1) Write short notes on the following:-

a) - Tomothrapy..... **(4marks)**

b) – Cyclotron..... **(4marks)**

c)- Palliative treatment ..... **(4marks)**

d)- Radiation therapist..... **(4marks)**

2) a) -Describe the linear accelerators .....(24 marks)

3)- a)- Define the cancer and its types.....(10marks)

b)- compare Temporary implant and Permanent implant.....(10 marks)

4)- a)- 70 fractions of 1.15 Gy given twice daily ,6 hours apart ,5 days per week for an overall treatment time of 7 weeks ; that is 70 fractions X 1.15 Gy twice daily / 7 weeks calculate E/ α.....(10marks)

b)- Write short note on Radiolabeled antibodies .....(10 marks)

Good luck
Dr. fatma elzhraa

٤ فيزياء حيوى - فيزياء المواد الحيوية , البيولوجية (فع ٢١٢)

Mansoura University Faculty of science Physics Department		Bio-Materials Exam Time: 2 Hours 1st Semester 2014-2015 4th Level

FINAL EXAMINATION

Specialization: Bio-physics

Full mark: 80 degrees

Answer the Following questions

No	Question	Marks
1	**Find the atomic packing factor for the BCC crystal Structure?**	5
2	**Write short note on the different classes of materials used in medical devices, along with their advantages and disadvantages of each?**	20
3	**What is the difference between: crystal structural and crystal system, thermoplastics and thermosets: ductille and brittle materials?**	10
4	**Define what's meant by tacticity. List its different types.**	5
5	**What is the factors affecting on the polymer to crystallize.**	5
6	**State the different characterizations of an ideal polymers, and the criteria followed in polymer selection.**	10
7	**What is the general mechanism of drug release from polymers.**	10
8	**State the physical meaning by Bioerosion of polymer. Discuss in brief the polymer erosion mechanism.**	10
9	**Construct a (111) plane within a cubic unit cell.**	5

With Best Wishes,

Prof. Dr. N.A.Bakr*