المستوى الرابع . فيزياء حيوية

فوق صوتيات وتطبيقاتها الحيوية ف ح ٤١٤

Mansoura University
Faculty of Science
Physics Department.
Subject: bio Phys.(414)
Title: ultrasonic &its applications

Final term exam – First Term
4th level /physics
Date: Jan. 2013
Allowed Time: Two hours.
Full Mark: 80

Answer the following questions

[1] a- Derive an expression for the sound power reflection coefficient, when a progressive plane wave in a fluid medium impinges on the boundary between two media? [15] Mark

b- state four of the advantages of ultrasonic inspection and four of its limitations? [10] Mark

[2] a- Describe with the aid of suitable drawing the main characteristics of piezoelectric transducers? [20] Mark

b- Calculate the end of the near field when using a 5 MHz, 0.375 inch diameter transducer to inspect a component made of brass. The sound velocity in brass is 0.1685×10^6 inch/second [10] Mark

[3] a-Explain how to measure the length of a crack using a crack tip ultrasonic diffraction technique? [15] Mark

b-By how much would the sound level increase when two sources sound simultaneously with equal power? [10] Mark

Best wishe: Prof. Dr. Kermal El-Farahaty & Prof.Dr.MAHER EL-Tonsy

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

Final term exam – First Term
Third level /physics
Date: Jan. 2013
Allowed Time: Two hours.
Full Mark: 80

Answer the following questions

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

b- Discuss the classical description of Raman scattering? [10] 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- Describe briefly the normal dispersion phenomenon using Cauchy's equation?(clarify your answer with suitable drawing) [10] Mark

[3] a- Derive Rayleigh equation for elastic light scattering by isolated small particle in vacuum in the following cases:
i) plane polarized light. ii) unpolarized light ? [25] Mark

b- Explain why the sky is blue? [5] Mark

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

المستوى الرابع فيزياء حيوية - فيزياء حيوية تجريبية - فرع ٤٠

جامعة المنصورة كلية العلوم قسم الفيزياء المنصورة – مصر		Mansoura University Faculty of Science Physics Department Mansoura - Egypt
January Examination 2013		
Subject: Physics 410 Experimental Biophysics Full Mark: 80		Fourth Year Time: 2 hours Date: 29/12/2012

Use the following constants when needed
Velocity of light in vacuum c =3×10^{8} m/s
Atomic mass unit (a.m.u) = 1.66 × 10^{-27} Kg
Planck's constant (h) = 6.63 ×10^{-34} J.s
electronic charge (e) = 1.60 ×10^{-19} C.

Answer the following question:

1	a	Compare between light, electron microscopes; give hints on advantages and disadvantages?	(10)
1	b	Give an example to describe the operation of a spectrometer mass analyzer?	(10)
1	c	Express 300 m in terms of cm^{-1} and 300 m in term of Hz.	(8)

Answer only <u>two questions</u> from the following:

2	a	What is meant by systematic error and explain systematic errors which can occur with instruments having a linear response?	(11)
2	b	What is meant by; Precision Propagation of errors Dipole relaxation	(15)
3	a	Define mass spectroscopy and its basic steps?	(10)
3	b	Write on; Betatron Advantage and disadvantage of AFM.	(16)
4	a	Discuss column chromatography separation technique?	(12)
4	b	What is meant by dielectric spectroscopy then list their mechanisms and discuss one of them?	(14)

With our best wishes:

Dr. Amr Mohamed Abdelghany

المستوى الرابع - فيزياء حيوية - المواد الحيوية والبديلة في ٢٠١٣

Mansoura University
Faculty of Science
Physics Department
Course code: Bio-Phys 413

First term 2012-2013
Date: 1-1-2013

4th Level Biophysics students
Full Mark: 80
Allowed time: 2 hours
Course title: Physics of Biomaterials and their substitutions

Answer all the following questions — **Marks**

1- a- Write on the amalgam as a direct restoration, chemical makeup and indication of using/not using amalgam. — 15

b- Why the applications of Non-bioreactive implant materials are very limited? — 5

C- Give the physical meaning of creep in materials — 5

2- a- Give the definition of a biosensor; make use of an example during your discussion? — 15

b- Mention the hazards of Metallic biomaterial degradation? — 5

C- Bioglass® materials and glass-ceramics are considered the most important surface-reactive biomaterials use as implants. Write on properties, composition and applications of these materials. — 10

3- a- Comment on the following sentence: — 10

The crystal structure for carbon has great effects on its properties.

b- Give reasons for Composite resin is better than Amalgam. — 10

C- List the main types of Biomaterials and explore the main advantages, disadvantages of each type. — 5

Best wishes:

Examiners: Dr. H. Kamal Prof. Dr. A. El-hanbaly

المستوى الرابع- فيزياء حيوية - فيزياء العلاج الإشعاعى فى 412

Mansoura University
Faculty of Science
Physics Department
Course code: Bio-Phys 412

4th Level Biophysics students
Full Mark: 80
Allowed time: 2 hours
Course title: Physics of Radiotherapy

First term 2012-2013
Date: 5-1-2013

Answer all the following questions: **Marks**

1- a- What do we mean by the word cancer? Write a short account on different types of cancer? 8

b- Which is better than the other, Parallel opposed fields or multiple fields in treatment techniques? 8

C- Discuss briefly stationary beams and rotation therapy as isocentric techniques. 9

2- a- What do we mean by Linear Accelerator equipment? Discuss the operation of this equipment? 15

b- Define the following: 10

I. Phantom
II. Dose
III. Relative dosimetry
IV. In vivo dosimetry

3- a- Thermo luminance dosimetry (TLD) is one of the most common dosimetric techniques, Describe this technique and mention advantage and disadvantage. 10

b- How Protection of the operator could be achieved during the usage of Intra-oral radiographic machine? 10

C- Define the following: Bragg peak- Cyclotron- Synchrotron –Tomotherapy. 10

Best wishes:

Examiners: Dr. H. Kamal Prof. Dr. E. El-shewy

المستوى الرابع - تشريح آدمي - فيزياء حيوية ٤٢٢ع

MANSOURA UNIVERSITY
FACULTY OF SCIENCE
ZOOLOGY DEPARTMENT

Jan.2013
3rd year Biophysics
Human Anatomy

Answer the following Questions:-

1- a) Types of bones (6 *marks*)
   b) Appendicular skeleton (6 *marks*)

2 - a) Subtypes of synovial joints . (6 *marks*)
   b) Systemic circulation of the blood . (6 *marks*)

3 - Give short account on :-
   a) Kidneys. (6 *marks*)
   b) Stomach . (6 *marks*)
   c) Uterus (6 *marks*)

4-The differences between:-
   a)Right and left lungs. (5 .*marks*)
   b)Atrium and ventricle of the heart . (5 *marks*)
   c)Sympathetic and parasympathetic nerves. (8 .*marks*)

Good luck

Prof.Dr. Fathy Abd El - Ghany

المستوى الرابع - فيزياء حيوية - معالجة إلكترونية للأنظمة الحيوية فيز ٤١١

University of Mansoura Faculty of Science Physics Department Subject: Physics		First Term Fourth Level Biophysics Date: Jan.22, 2013 Time allowed: 2 hours
Course (s): Phys 411 (Electronics Simulation for Biological Systems)		Full Mark: 80

Answer the Following Questions

1-

a) Explain the basic construction of a silicon p-n junction solar cell then explain how it operates. (10 marks)

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

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

2-

a) Define the positive feedback and negative feedback, then draw only a circuit of an audio frequency oscillator. (7 marks)

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

c) Draw the V-I characteristic curve for JFET, and explain why the curve has this shape. (6 marks)

d) Draw the universal biasing circuit for a bipolar transistor amplifier. Explain the significance of each element in the circuit. (7 marks)

3-

a) Describe the main difference between the unipolar and bipolar devices. (5 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. (15 marks)

c) Determine I_D, V_D, V_{DS} and V_S for the fixed bias circuit of Fig.(2). (10 marks)

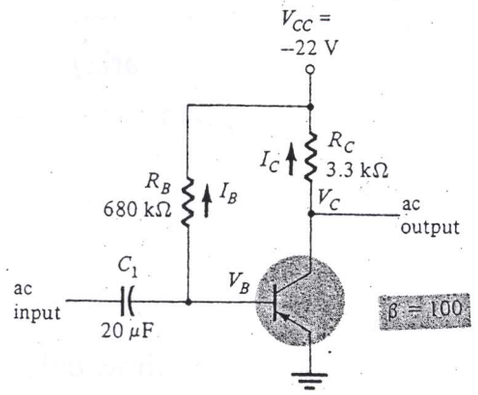

Fig.(1)

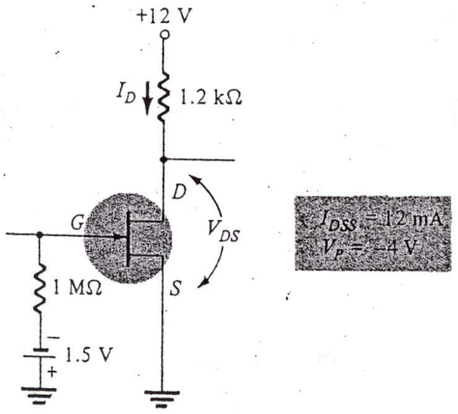

Fig.(2)

Examiners:

1) Prof. Dr. Ahmed H. Oraby

2) Prof. Dr. Magdi Eshra