Mansoura University | **Second term Exam, 16 /5/2015**

Faculty of Science | **4th level Biophysics**

Physics Department | **Time allowed: 2 hours**

Full mark : 80 marks

Subject : physics **Course : 410 ف Laser and its applications**

Answer the following questions:

1- a) Evaluate Doppler half width. (if the fraction of atoms whose component of velocity lies between v_x and $v_x+\delta v$ is given from the relation,

$$\frac{\Delta N}{N} = \sqrt{\frac{M}{2\pi KT}} e^{-\left(\frac{Mv_x^2}{2KT}\right)} \Delta v_x$$

where M is the molecular weight, K is the gas constant and T is the absolute temperature).

(13 marks)

b) Explain the experimental arrangement for observing the longitudinal mode characteristics of a laser source .

(13 marks)

2- a) Deduce the condition of population inversion in a four-levels laser system. Show that the population inversion can be obtained in these systems with very week pumping.

(20 marks)

b) If a laser device is designed with a beam waist of 0.5 cm diameter and have wavelength of 200 nm, Calculate the laser beam divergence angle ϕ.

(7 marks)

3- a) Sketch and explain the simple components of He - Ne gas laser. Give by the aid of an energy level essential features of this laser and some characteristics of its radiation. Explain a technique to encourage the 632.8nm transition in this laser. (20 marks)

b) Sketch schematic diagram for recording a hologram and reconstructing the wavefront.

(7 marks)

With my best wishes

Prof. Dr. Taha Sokkar

Mansoura University
Faculty of Science
Physics Department
Subject: Nuclear Medicine

Second Term Exam
4st Year Biophysics Students
Date: 19 may 2015
Time Allowed: 2 hours

1) a) (a) The half-life of 99mTc is 6 hours. After how much time will 1/16th of the radioisotope remain?
8Marks

b) Explain the decay laws Relationship between the Decay Constant and the Half Life. **12 marks**

2) Compare between the following: **20 Marks**

1) alpha decay ,beta decay and Gamma decay .
2) Photoelectric effect and compton scattering

3) a) *Explain attenuation* OF gamma-rays and *mass attenuation* coefficient *20 marks*

4) a)- How much alu*minum is required to reduce the intensity of a 200 KeV gamma-ray beam to 10 % of its incident intensity, Assume that half layer for 2oo KeV gamma –rays in Al is 2.14 cm.*
10 marks

b)- *Describe the classification of nuclei and nuclear stability*
10 marks

Good luck
Dr. Fatma mansour

Mansoura University
Faculty of Science
Zoology Department
Courses: Immunology & Molecular Biology
Academic Year: 2014-2015

Second Term - Final Exam
4th Level Students
Date: 23 May, 2015
Time Allowed: 2 hrs
Full Mark: 60

Answer All Questions

Part I Immunology

Question 1 **(15 marks)**

Write short notes on (Draw when needed):

a) Development of T and B cells.

b) IgG.

Question 2 **(15 marks)**

A- Complete:

a) Skin, mucous membranes and cilia are among the components of ..... immunity.

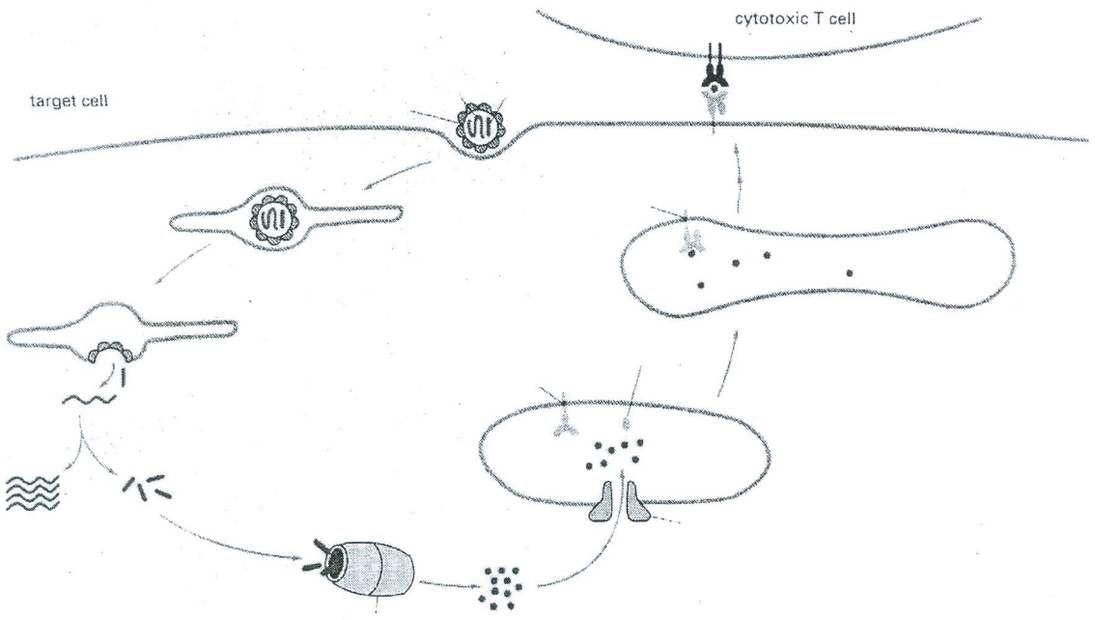
b) ..... cells develop in the thymus and function in the ..... lymphoid organs .

c) Mothers' milk has ..... and ..... classes of antibodies.

d) Membrane-attack complement components include ..... , ... , ... , ... , ...

e) Cytotoxic T cell has ..... co-receptor.

B- Identify, draw and put the labels for the following diagram:



أقلب الصفحة من فضلك ←

Part II: Molecular Biology

Q. 3: Write on the Following Statements: **(20 marks, 5 Marks each)**

A: *Applications of recombinant DNA technology.*

B: *Type II Restriction endonucleases enzymes.*

C: *Characteristics of cloning vectors.*

D: *How are plasmids transferred into bacterial cells?*

Q. 4: Write short notes on the Following items: **(10 marks, 5 Marks each)**

A: *Difference between Polyacrylamide and agarose Gel.*

B: *The main steps of Polymerase Chain Reaction (PCR).*

With our best withes

Prof. Dr. Shrif Abdeen

Dr: Sayed Kamel Areida

Mansoura University Faculty of Science Physics Department El- Mansoura , Egypt		جامعة المنصورة كلية العلوم قسم الفيزياء المنصورة – مصر

Final Exam Second Semester ; 2015

Time : Two hours | **Educational Year : level four**

Date : 26/5/2015 | **Subjects : Radiation protection**

Mark: 80 Mark | **Course Code : Bio-phys.421**

Answer All the Following Questions:-

1. I Discuss The Following:- **[20 Marks]**

(a) Biological effects of radiation.
(b) the shielding for alpha, beta and gamma radiation hazard.
(c) radon-222 problem.

1.II Define the following :- **[15 Marks]**

exposure rate – dose equivalent – LD_{50} dose -
relative biological effectiveness(RBE).

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2. I Write short account on the following:- **[20 Marks]**

(a) The personal monitor devices.
(b) The types of late effect of radiation.
(c) Nature and origin of radiation.

2.II Solve the following :- **[10 Marks]**

What is the absorbed dose you receive by working for 2 hours at an average distance of 50 cm from a A=100 μCi ^{22}Na source?
(Γ=12 ,D= 9.5×10^{-3} Gy for 1R exposure)

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3. I- Differentiate between Acute lethal response and chronic exposure response. **[10 Marks]**

3. II- Solve the following problem:- **[5 Marks]**

The intensity of unshielded Cs-137 source is 1rad/hr. If the source is put into a lead shield two inches thick, what would be the intensity on the outside the shield?
(density of lead=11.35gm/cm^3 ,μ_m =0.114 cm^2/gm)

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Good Luck

Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology (Z 423)
Courses Human Physiology

Second Term
4th Level: Biophysics
Date: 30/5/2015
Time Allowed: 2hr
Full Mark: (60)

Answer all the following questions

First Question: A- Choose the correct answer : (10 marks)

1- Maltose contains which of the following monosaccharide?
a- Glucose and galactose b- Glucose and fructose
c- Glucose only d- Galactose and fructose

2- The end products of protein digestion are ----------
a- Peptones b- amino acids c- Monosaccharides d- Fatty acids and glycerol

3- HCl is formed in cells that contain an enzyme called ---------- which catalyzes the reaction between ---------- and water.
a- Carbonic anhydrase – CO2 b- amylase – HCO3
c- Carbonic anhydrase – HCO3 d- Pepsin – CO2

4- The first product of fatty acid catabolism is ----------
a- triglycerides b- pyruvate c- glycerol d- acetyl CoA

5- The chemical digestion of ---------- begins in the mouth through the action of the enzyme ----------
a- Fat – lipase b- Fat – bile
c- Carbohydrates – salivary amylase d- Protein – pepsin.

6- Hormone ---------- promotes sodium ion and water reabsorption in the distal tubule and collecting duct.
a- aldosterone b- renin c- erythropoietin d- creatinine

7- The digestion of lipids is completed in the ----------
a- stomach b- small intestine c- large intestine d- mouth

8-The site of production of cholecystokinin and secretin is the ----------
a- stomach b- pancreas c- small Intestine d- large Intestine

9- The conversion of amino acids to glucose is an example of ----------
a- glycogenesis b- glycogenolysis c- glycolysis d- gluconeogenesis

10- All of the following are substances found in pancreatic juice EXCEPT ----------
a- pepsin b- trypsin c- amylase d- lipase

11- Which of the following hormones increase reabsorption of water in the collecting ducts?
a- renin b- ADH c- secretin d- aldosterone

B- Define FIVE ONLY of the following: (10 marks)

1- Beta oxidation 2- Glycogenesis. 3- Transamination. 4- Disaccharides
5- Triglycerides. 6- aminopolypeptidase 7- Essential nutrient

Second Question: A- Fill in the blanks: (10 marks)

I- Complete the table:

Site	Enzyme	Substrate	products
Mouth	--------(1)-------	starch	-------(2)-------
Stomach	pepsin	--------(3)-------	--------(4)-------
Small intestine	-------(5)---------	polypeptides	-------(6)--------
Small intestine	lactase	-------(7)-------	--------(8)--------
-------(9)---------	lipase	-------(10)-------	Fatty acids and glycerol

II- From the parts of the nephron are:

a- ------(11)---------- b- -----(12)---------- c- -----(13)----------

III - Three factors affecting the enzyme activity are:

a- ----(14)---- b- ----(15)--- c- ------(16)---------

IV- Two types of monosaccharides are : ---------(17)-------, --------(18)----------

V- Two functions of the kidney are: --------(19)------- and -------(20)----------

Third Question: **(30 marks)**

A - Briefly discuss three only of the following: **(12 marks)**

a- Sources of plasma proteins b-Mechanism of hemostasis.

c- Factors affecting erythropoiesis d- Role of oxygen in respiration

B- Predict the disease resulting from the following cases (6 Marks)

1- Decreasing in platelets 2- Decreasing hemoglobin

3- High level of Leukocyte

C- Mention the physiological function of

Oxytocin Aldosterone Leucocytes **(6 Marks)**

D- Complete the following sentences: **(6 Marks)**

1- Blood composed of ----------&----------

2- An increase in RBCs causes ----------due to ----------

3- An increase in platelets count causes-------While a decrease in WBCs causes --------

4- Hormones classified into ----------

5- Muscles structure include----------,----------,----------,----------,-------

6- ----------act as a cofactor for thrombin synthesis from----------

مع تمنياتنا بالتوفيق

اد السيد الحبيبى اد هناء على حسن

Mansoura University Faculty of Science, Physics Department	بسم الله الرحمن الرحيم **Final Exam** **2014/2015** **For the 4th. Year Biophysics Students** **(Phys. 432)**	Time Allowed : Two Hours Subject: Optical Instruments Total Marks = **80 M**

Answer the following questions:

1 - a) Report on the types of electrons inside the scanning electron microscopy. **(13 M)**

b) What is the resolution element? How this element depends on the so called **NUMERICAL APERTURE (NA)? (13 M)**

2 – a) Explain the structure and operation of the polarizing microscope. **(13 M)**

b) Discuss basics of the theory of **fluorescence microscopy** referring to the role of cellular staining. **(13 M)**

3 – a) What are the problems that restrict the wide applications of electron microscopes? **(13 M)**

b) Show how electron microscopes could overcome limitations of the optical microscopes. **(15 M)**

Best wishes

Prof. Dr. Maher El-Tonsy

June 2015