Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology
Course :Cytogenetics(Z-221)

2nd level- Biophysics
1st term-2012-2013
Date: 26/12/2012
Time: 2 hours
Full Mark: 60

Answer the following questions:-

Question 1 (20 Marks)

A Answer only one of the following:

1- Describe the morphology of Golgi apparatus and mention its function . Illustrate by a labeled diagram.

2- Describe the morphology, kinds and function of lysosomes. Illustrate by a labeled diagram.

B- Write notes on only one of the following:

a-Bulk transport by the plasma membrane.

b-Changes in chromosomes structure that lead to genetics disorder.

Question 2 (20 Marks)

Complete:

1. In mitotic division, anaphase is followed by ….. and……..
2. The chromosomes of a eukaryotic cell are located in the……..and the lysosomes are located in…….
3- The organelle involved in energy production is called…….
4- Levels of organization start by…. and end by …..
5-Trisomy21 leads to a genetic disorder called…….
6- The nucleus is made up of …..; …..; …..; …..
7- Carbohydrates of the plasma membrane are located only in …….
8- The main function of lysosome is ……
9-Homologous chromosomes exchange parts of chromatids in prophase I by a process called….
10- Prokaryotes are organism made up of cells that lack….
11- Primary lysosomes are …… while 2ry lysosomes are….
12- Cell division in prokaryotes is known as ……
13-……. is a loss of chromosomal segment.
14- Meiosis occurs in …….cells while mitosis occurs in……..
15-Women affected with……..syndrome typically have a chromosome number of 45instead of 46.

Question3

Match A with B appropriately: **(20 Marks)**

A	B
a. Endoplasmic reticulum	1- control center of the cell.
b.Karyotype	2- a complex network of interconnection in a cell
c. Nucleus	3-causes gametes to have abnormal chromosome numbers.
d. Smooth Endoplasmic reticulum	4- site of protein synthesis in the cell
e. Lysosomes	5- function in detoxification of toxic material in liver
f. Polyploidy	6- consists of bilayer of lipids and proteins
g. Nondisjunction	7- move chromosomes through cytoplasm during cell devision.
h. Ribosome	8- is a representation of the total chromosomes content in a cell.
i. Plasma membrane	9- contains digestive enzymes.
j. Spindle fibers	10- possession of more than two sets of chromosomes.

Best of luck ***Prof.Dr Nariman K. Badr El-Din***

المستوى الثاني - فيزياء - فيزياء حيوية - فيزياء المرونة (ف ٢١٥)

Mansoura University Faculty of Science Physics Department Course Title: Elasticity Date: 24/12/2012	Jan. 2013 Exam Type: Final Second Level : (Biophysics) Time: 2 Hours Full Mark: 80 Mark

Answer the following questions:

1- a- What the difference between elastic and viscoelastic material? [10 Mark]

b- What is the meant by fatigue and mention the type of it. [6 Mark]

c- Write on the following: - Stress- Elasticity- Strain [9 Mark]

2- a- What is the meant by creep and Mention the types of it. [10 Mark]

b- Write on the following: - [15 Mark]

Dynamic modulus- Deformation- Toughness- Resilience

3- a- Explain the factors affecting on the fatigue life. [10 Mark]

b- Write on the following:-

Elastic moduli- Fracture – Stages of creep [15 Mark]

c- Discuss Stress- Strain curve [5 Mark]

With best wishes

Examiners

د.نبيل قناوى

أ.د. أبوبكر البديوى

المستوى الثانى - فيزياء حيوية - ضوء فيزيائى ف ٢٢١

Mansoura University Faculty of Science Physics Department		**First Term Exam, 2013** **Second level** Date: **30-12-2012** Time allowed : **2 hours** Full Mark: **80 Mark**
Subject: **Physics**		Course: **Physical Optics 221 ف**

Answer the Following Questions

[1] a- Give a model to discuss Fraunhofer diffraction pattern when using a rectangular slit. Derive an expression for the intensity distribution of the observed diffraction pattern. **[18 Marks]**

b- When a thin sheet of transparent material of thickness 6.3×10^{-4} cm is introduced in the path of one of the interfering beams, the central fringe shifts to a position occupied by sixth bright fringe. If $\lambda = 5460\ A^{o}$, find the refractive index of the thin sheet . **[9 Marks]**

[2] a-Derive an expression for the intensity distribution in a Fabry-Perot system of interference fringes in transmission when the two coated plate are of same transmission coefficient T and reflectivity R. **[18 Marks]**

b-In a Jamin's refractometer, two evacuated tubes each of length 25 cm are placed in the two beams. A gas is slowly admitted and 125 fringes cross the centre of the field of view. Calculate the refractive index of the gas. ($\lambda = 5460\ A^{o}$). **[8 Marks]**

[3] a- If you have tourmaline crystal and unpolarized monochromatic light source. Construct an experiment to produce a beam of plane polarized light. **[10 Marks]**

b- Give the arrangement of Young's experiment to produce interference fringes. Derive expression for the conditions of the bright and dark fringes. Descrip these fringes. **[17 Marks]**

Good Luck

Examiners: Prof. Dr. Taha Sakkar, Prof. Dr. Eman Seisa , Prof. Dr. Mohamed Kabeel

Mansoura university Faculty of Science Physics Department		first Term Second Year: Biophysics Date: 2 jan. 2013 Allowed time: 2 hours
Electricity in Bio-systems Exam. Code: 210		Full Mark: 80 Marks

Answer the following Questions:

1] Write briefly on
Neuron equivalent circuit - Resting potential – Action potential.
The internal circuitry configuration of operational amplifier

2] a- Derive an expression of the out put voltage in terms of the input voltage for the Circuits of 1- operational integrator
2- Non inverting Operational amplifier.

b – Calculate the value of R in the circuit of figure (1) which makes its output voltage equals the average value of its input voltages.

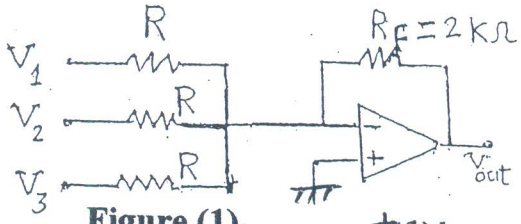


Figure (1)

3] a- Derive the condition required for stable operating point of the transistor circuit in Figure(2) .

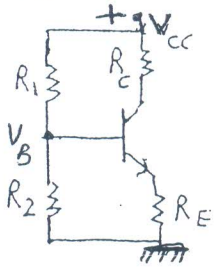


figure (2)

b – Determine the overall minimum and maximum voltage gain of the two stages amplifier circuit shown in figure (3) , given that

R_1 = 10 K, R_2 = 2.2 K
& R_{C2} =1 K , R_{E1}= 100 ohm
R_{E2} = 0 To 900 ohm
R_{C1} = 3 K , R_E = 650 ohm
& $\beta_{dc} = \beta = 150$.

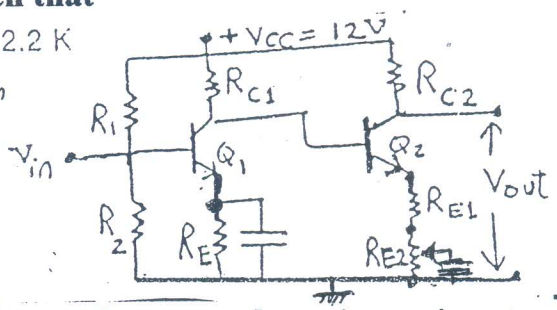


Figure (3)

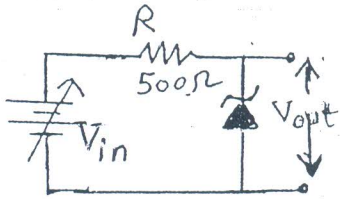
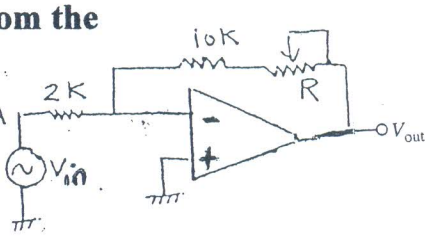


Figure (4)

4] a- Determine the minimum and maximum input voltages that can be regulated in the Zener diode circuit of figure (4) , then determine the change in output voltage when the input voltage varies from the minimum to the maximum value , given that I_{zk} =1 mA , r_z =10 ohms and(V_z= 6.2 volts at I_{zk} =1 mA) I_{zm} = 15 mA

b – Determine the values of R in the inverting operational amplifier circuit of figure (5) which makes its voltage gain change from – 20 to – 80 .



Figure(5)

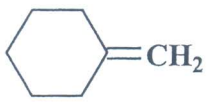
Examiner: Dr. Hamid Ibrahim

Mansoura University Faculty of Science Chemistry Department Subject : Chemistry Course: Organic Chemistry (235)		First term 2th level students Date: Jan. 2013 Time allowed: 2 hours Full mark: 60 marks

Answer the following questions:

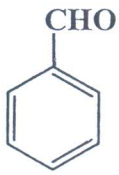
1- Complete the following equations: (20 marks)

i- $CH_3-CH=C(CH_3)-CH_3$ (with CH_3 on the C) $\xrightarrow[H_2O_2]{HBr}$ .....

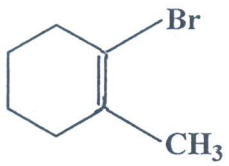
ii-  $\xrightarrow{O_3}$ .....

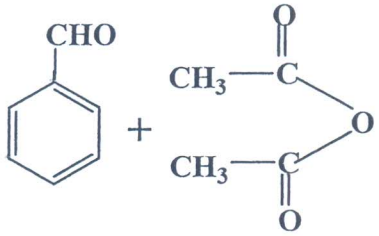
iii- $4\ CH_3-C\equiv N \xrightarrow{LiAlH_4}$ .....

iv- $H_3C-C(CH_3)_2-CHO$ $\xrightarrow[NaOH]{I_2}$ .....

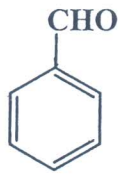
v- CH_3CHO +  $\xrightarrow{NaOH}$ .....

vi- $H_3C-C\equiv H$ $\xrightarrow[2-\ CH_3-Cl]{1-\ Na}$ .....

vii-  $\xrightarrow{alc.KOH}$ .....

viii-  $\xrightarrow{sod.acetate}$ .....

ix- $H_3C-CH=CH_2 \xrightarrow{Cl_2/H_2O}$ .....

x- 2  $\xrightarrow{NaOH}$ .....

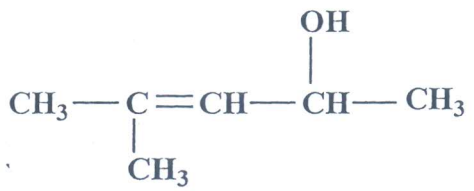
P.T.O

2- a) Draw the chemical structure of the following compounds: (5 marks)

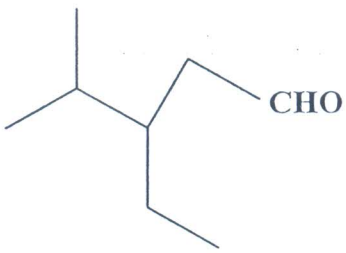
i- 2-chloro-5-ethyl-8,8-dimethylnonane.
ii- 5-methyl-4- hexene-2-one.

b) Give the IUPAC name of the following compounds: (5 marks)

i-



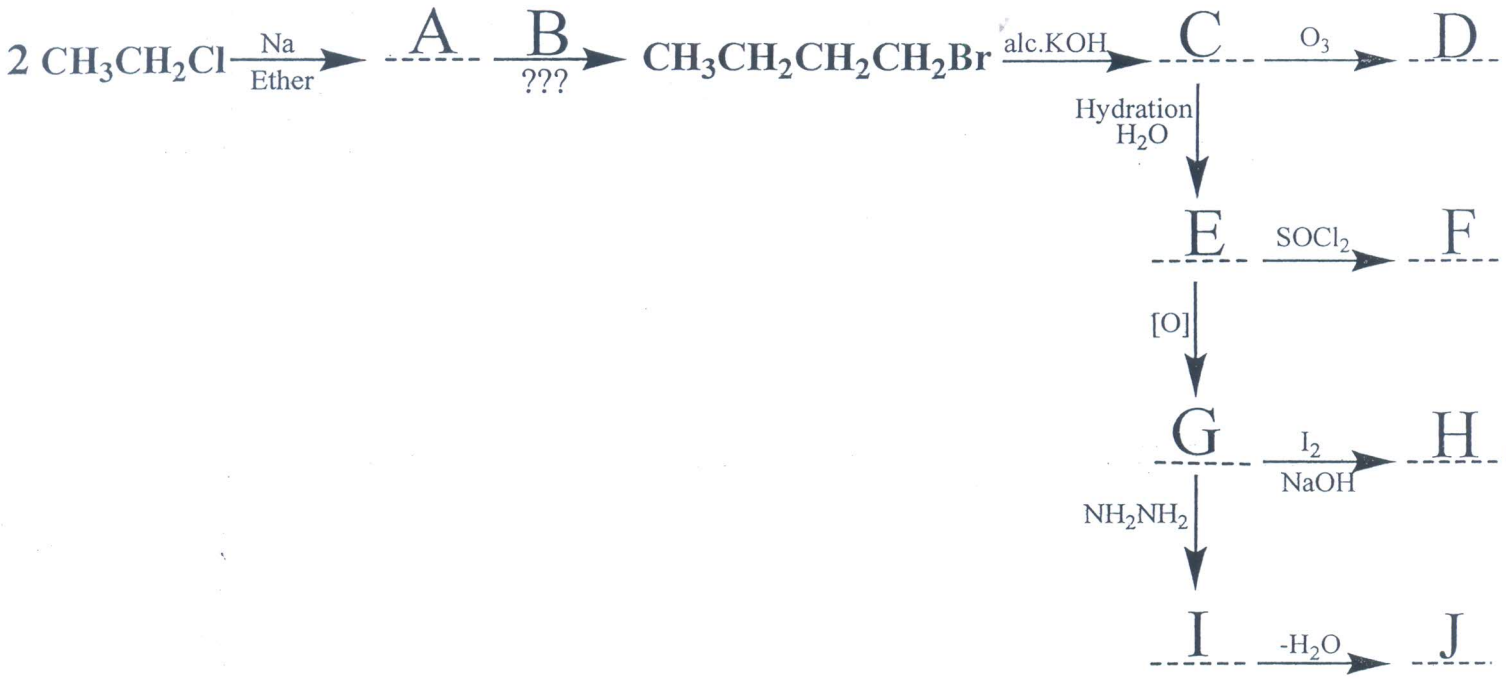
ii-



C) Show how you can do the following conversions: (10 marks)

i) Ethylene to Acetone.
ii) 1-propanol to 2-propanol.
iii) Ethane to Chloroform.
iv) Propyl chloride to propeneoxide.

3-Complete the following scheme: (20 marks)



With our best Wishes;

Prof. Dr. A.A. Fadda, Dr. D.M. Ayad, Dr. M. El Sayed, Dr. M. Monir.

المستوى الثانى - فيزياء حيوية - فيزياء طبية ف ٢٠١٣

University of Mansoura Faculty of Science Physics Department Subject: Physics		First Term Biophysics Students Date: Jan. 2013 Time allowed: 2 hours
Course (s): Phys 221	Modern Physics	Full Mark: 80

Answer the Following Questions

1-a) Write on the characteristic of the photons. [5 Marks]
b) In Compton scattering find a relation between the scattered photon and the incident one and the scattered angle. [15 Marks]

2) Suppose that x-ray of 100 keV energy are incident on a target and undergo Compton scattering. Calculate: (a) The energy of the x-ray scattered at an angle of 30^{o} to the direction of the incident. (b) The energy of the recoiling electron. (c) The angle of the recoiling electron. [20 Marks]

3-a) A meter stick is 100 cm long and 2 cm wide. At what velocity must the meter-stick be moving so that its length measures the same as its width 2 cm?
(b) What is the momentum of a particle whose kinetic energy equals its rest energy E_o ?
(c) Find the velocity and momentum of an electron whose kinetic energy equals its rest mass energy (0.511 MeV). [20 Marks]

4) A high-energy particle, say A, of rest mass m_o and moving at a speed V_A =0.80C relative to the laboratory system S, collides with a target particle B, initially at rest and having rest mass $2m_o$.
a) What is the total energy E of the particles in the lab. system S ?
b)Find the velocity of the center-of-mass inertial system $S^{/}$ (in which the total momentum is defined to be zero) relative to the laboratory.
c) What is the total energy $E^{/}$ in the center-of-mass system $S^{/}$? [20 Marks]

Examiners: (1) Prof. Dr. Mahmoud Abouzeid (2) Prof. Dr. Mohamed Qabeil
3) Dr. Ahmed Abou-Elela (4) Dr. Safaa Abdoul-maksoud

Mansoura University
Faculty of Science
Physics Department
Course code: Bio-Phys 211
Course title: General biophysics

First term 2012-2013
Date: 16-1-2013

2nd Level students
Biophysics-Physics-Microbiology-Chemistry-Biochemistry-Chemistry Botany - Chemistry Zoology and Environmental Science
Full Mark: 80
Allowed time: 2 hours

Answer all the following questions:

1- A- Write true (√) or False (χ) **[each item = 1.5 Mark]**

i. The frequency range detected by the human ear is between 20 Hz-20000 KHz.
ii. Hypermetropia caused by irregularity shaped cornea results in light focusing in front of retina.
iii. There are three types of color sensitive cones in retina.
iv. The human eye is organ design to receive visible light having wavelengths between 380 and 760 μm.
v. Ionizing radiations are known to cause DNA damage, cancer, mutation and birth defects.
vi. The electric potential of the heart can be measured by electro-encephalogram EEG.
vii. There are negative charges on the outside of the cell membrane of neurons than the inside produces a resting potential of -70 mV.
viii. The conduction speed of unmyleinated axons is given by $u = 1.8\sqrt{a}$ (m/sec) where a is the radius of axon (μm).
ix. The efferent neurons are those axons travel from sensing areas to the spinal cord
x. The ear canal behaves like a pipe open from one end and the other end is closed by tympanic membrane.

B- Calculate the lowest frequency in which sound resonates in ear, knowing that the velocity of sound is C=350 m/sec and the ear canal length is L=2.5 cm (n=1 when $L=\lambda/4$). **[5 Marks]**

C- What is the total flow resistance of a two parallel arteries in a calf have radius 0.5 mm and length 100 mm? If the volume flow rate of blood through these arteries is 1.2×10^{-6} m^3/sec, what is the pressure drop across the arties knowing that $\eta_{blood}=3.5\times10^{-3}$ poise.

[5 Marks]

2- A- Complete the following sentences: (each item = 2 Mark)

- The P-Wave in ECG indicates .....(1).....of the right and left .....(2).....

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- The alpha waves of EEG have frequency range ……(3)……Hz in ……(4)…….state.
- In ……(5)…….effect, electron is ejected from the atom and is accompanied by scattered …(6)…….

B- Find an expression given for the half life time and decay constant of a radionuclide?

[8 Marks]

C- If you have 1gm of ^{226}Ra that emits $3.7x10^{10}$ photon/sec. What is the decay constant and half life time knowing that Avogadro's number=$6.02x10^{23}$. **[5 Marks]**

3- A- Choose the correct answer : **[each item = 1 Mark]**

i. The retina of the eye contains two types of photoreceptors cones and …… (Spheres- triangles- rods-rectangles).

ii. The flow of ions causes an electric current in the ion chamber with intensity proportional to the ……of ions (volume- number-density –shape).

iii. The beta particles are a fast moving ……(protons-neutrons-electrons-photons).

iv. …… provide the eye's color sensitivity (Rods –Cones- Corneas –Irises).

v. The percent of hydrogen atoms in human body is (53%-63%-73%-83%).

vi. About …….. of cones are green sensitive. (23%-42%-52%-62%).

vii. 1 gray equal (1 rad- 10 rad-100 rad-1000 rad).

viii. 1 rem equal (0.1 Sv-0.01 Sv-0.001 Sv-0.0001 Sv).

B- Define the following: **[each item = 2 Marks]**

a. Depolarization
d. Decibel
b. Graded potential
e. Magnetic resonance imaging
c. Radiation flux

C- Calculate the capacitance per unit length and area of an unmyleinated axon, if the material in the axon membrane has dielectric constant K=7 and $\varepsilon_o=8.85x10^{-12}$ S/ohm-m and the radius a= $3.5x10^{-6}$ m and thickness of membrane is b=$5x10^{-9}$ m. **[7 Marks]**

D- If a person has an unaided near point of 0.5 m, what would the power of a lens make him able to see an object at 25 cm? **[5 Marks]**

Best wishes:

Examiners: Dr. H. Kamal Dr. N. Kenawi Dr. M. Mansour

الإمتحان مكتوب على وجهى الورقة

المستوى الثانى - فيزياء - اهتزازات وموجات ف ٢١٠
فيزياء حيوية

Mansoura University
Faculty of Science
Physics Department
Subject : Physics
Course(s): 210 : Vibrations & waves

First Term
Level2: physics & Biophysics
Date Jan. 2013
Time Allowed: 2 hours
Full Mark: 90 Mark

Answer The following questions

[1]	a- Solve the differential equation of forced oscillating waves.	[10]Mark
	b- Find the normal mode of oscillation of a wave propagates in a rod fixed at both ends.	[10]Mark
	c- A spring is hanged vertically and fixed at the upper end. A mass of 7 Kg is fixed at the other end. The mass is pulled down a distance of 5 cm and left, find i) the maximum amplitude ii) the periodic time iii) the total energy	[10]Mark
[2]	a- Define the transmittance coefficient and prove that it depends on the density per unit length of both parts of the string.	[15]Mark
	b- Find the apparent frequency at a detector for a source of wave moves with velocity U away from the detector.	[15]Mark
[3]	a- Find the condition to obtain a straight line with negative slope as a resultant of the superposition of to perpendicular waves.	[15] Mark
	b- Prove that the total energy of a SHM proportional with amplitude.	[15] Mark

Examiner

1- Prof. Mahrous Shaker