Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology
Course: Cytogenetics (Z221)

First Term
2nd year Biophysics students
Date: 11 Jan 2011
Time Allowed: 120 min
Full Mark: 60 (20/question)

Attempt ONLY TWO items from each question, use simple drawing when needed

Q1. Write on:

a. Gene organization.
b. Chromosome morphology.
c. Stages of mitosis.

Q2. Describe with drawings:

a. Translocations.
b. Deletions.
c. Gene structure in prokaryotes.

Q3. a. Write all what you know about euploidy.

b. Draw the steps of gene expression.

c. Determine the protein belonging to the following DNA sequence:

5' ATGACGTTTGATTTCATGTTAAAGTACTAA 3'

First base (5'-end)	Second base				Third base (3'-end)
	U	C	A	G	
U	Phe	Ser	Tyr	Cys	U
	Phe	Ser	Tyr	Cys	C
	Leu	Ser	STOP	STOP	A
	Leu	Ser	STOP	Trp	G
C	Leu	Pro	His	Arg	U
	Leu	Pro	His	Arg	C
	Leu	Pro	Gln	Arg	A
	Leu	Pro	Gln	Arg	G
A	Ile	Thr	Asn	Ser	U
	Ile	Thr	Asn	Ser	C
	Ile	Thr	Lys	Arg	A
	Met	Thr	Lys	Arg	G
G	Val	Ala	Asp	Gly	U
	Val	Ala	Asp	Gly	C
	Val	Ala	Glu	Gly	A
	Val	Ala	Glu	Gly	G

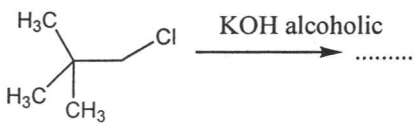
Good Luck
Assistant Prof. Sherif H. Abdeen
Prof. Dr. Tahani Amer Mohamed

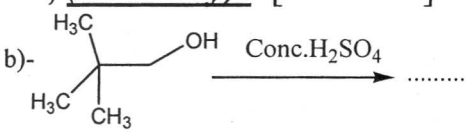
Mansoura University
Faculty of Science
Chemistry Department
Subject: Chemistry
Course: Organic
Code: 235

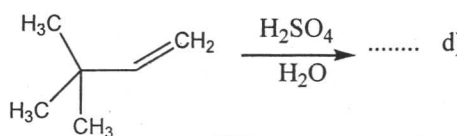
First term
second level students
date: Jan. 20/1/2011
Time allowed: 2 hours
Full mark:60 marks

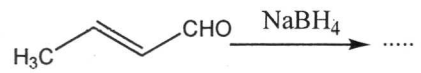
Answer the following <u>Three</u> questions:

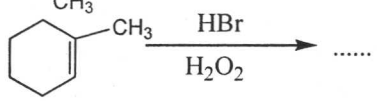
1-Complete the following equations; ***(Five only):*** [20 marks]

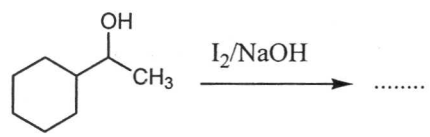
a)- 

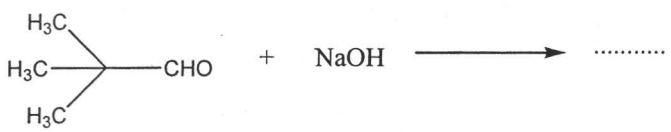
b)- 

c)- 

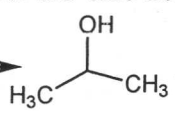
d)- 

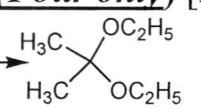
e)- 

f)- 

g)- 

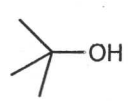
2-Show how can you do the following conversions: ***(Four only)*** [20 marks]

a)- Propane 

b)- Methylacetylene 

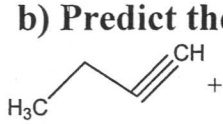
c) 1-Butene ⟶ 2-Butene

d)- Acetaldehyde ⟶ Acetylene

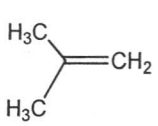
e)- Acetone ⟶ 

3- a) Fructose and glucose gave the same ozazone, Comment. (4 marks)

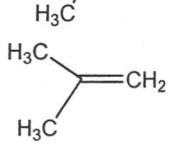
b) Predict the products of the following reactions: ***(Four only)*** (16 marks)

a) 

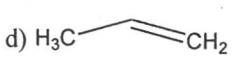
+ $NaNH_2$ ⟶ ..... CH_3Cl ⟶ .....

b) 

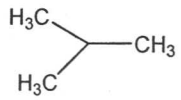
+ O_3 ⟶ .....

c) 

+ ICl ⟶ .....

d) 

+ Cl_2/H_2O ⟶ .....

e) 

+ Cl_2 ⟶ .....

<u>Best wishes</u>

Mansoura University Faculty of Science Physics Department Course Title: Elasticity Date: 27-1-2011		May. 2010 Exam Type: Final Second Level : (Physics & Bio) Time: 2 Hours Full Mark: 80 Mark

Answer the following questions:

1- a- Discuss the factors affecting on the fatigue life. [10 Mark]

b- Write on the following:-

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

2) Stress- Strain curve [5 Mark]

2- a- Compared between elastic behavior and viscoelastic behavior? [10 Mark]

b- Write on the following:-

1) Stress- Fatige [10 Mark]

2) Elasticity- Strain [5 Mark]

3- a- Explain what is the meant by creep and Mention the types of creep?. [10 Mark]

b- Write on the following:-

Toughness- Resilience- Dynamic modulus- Effects of temperature on Viscoelastic behaviour- Deformation [15 Mark]

Examiners

أ.د. أبوبكر البديوى د. نبيل قناوى د. أنور مجاهد د.عماد خضر الشيوى

Mansoura University
Faculty of science
Physics Department
El-Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم الفيزياء
المنصورة- مصر

First Term Examination Jan. 2011

Subject: Physics
Time: 2 hours
Date: 9 / 1 / 2011

Course(S): ف ٢٢١ Physical Optics
Full Mark: 80 Marks

Answer the following questions:

1-a) Discuss Fraunhofer diffraction using a rectangular slit. Drive an expression for the intensity distribution of the observed diffraction pattern. (15 Marks)

b) A grating with 8000 rulings/inch is illuminated with white light at normal incidence. Describe the diffraction pattern at the center and the first order assuming that the wavelength of the light extends from 4000A° to 7000A°. (12 Marks)

.....

2-a) Give a brief account with an explanatory of the optical arrangement of Newton s rings interferometer. Derive the necessary formula of these rings. Discuss that the forming of dark spot in the center of the rings at reflection confirm the principal of change of phase at reflection. (15Marks)

b) A thin sheet of transparent material have refractive index ($\mu = 1.6$) is placed in the path of one of the interfering beams in a biprism experiment using sodium light of wavelength ($\lambda = 5890$ A°). The central fringe shifts to a position normally occupied by the 12^{th} bright fringe. Calculate the thickness of the sheet. (12Marks)

.....

3-a) Give account with an explanatory diagram of the optical arrangement of the polarimeter. Explain the method of measuring the strength of a solution have optical activity with that polarimeter. (15Marks)

b) In a Mach – Zehnder, when one of the beams passes through a wide tunnel of length 10 meters, 120 fringes cross the center of the field of view. Calculate the change in refractive index if the wavelength of the light used is equal 5890 A°. (11Marks)

Good Luck Prof. Dr. Taha Sokkar, Dr. Mohamed Kabeel & Dr. Eman Sesa

University of Mansoura **Faculty of Science** **Physics Department**		**First Term** **Sophomore Students** **Date: January 2011** **Allowed time: 2 hours** المنصورة- مصر
Exam: Introduction to Biophysics	**Code: 211ج ف**	**Full Mark: 80 Mark**

Answer all the following question:

[1] a- Discuss the electrical properties of a neuron? [10 Marks]

b- Calculate the pressure variation corresponding to a sound intensity of 10^{-16} W/cm^2. The density of air at 0°C and 1 atm pressure is 1.29 x 10^{-3}g/cm^3. The speed of sound is 3.3 x 10^4 cm/sec ($I = 10^{-16}$ W/cm^2 = 10^{-9} erg/s.cm^2)? [5 Marks]

C- Discuss in detail different radiation biological effects on mammalians? [10 Marks]

[2] a- Estimate numerically the speed of propagation of nerve impulse propagation across an myelinated and unmyelinated axon? [7 Marks]

b- Calculate the photon flux at 1 m and 2 m from a ^{60}Co gamma source of activity 800 MBq? [8 Marks]

c- Define the followings: **(Answer five items only)** [10 Marks]

i) Friction force ii) Sivert iii) Ionization chamber iv) Intensity of sound wave

iiv) Decibl v) Non-stochastic Effect

[3] a- What is the total flow resistance of a three parallel arteries in the calf which have radius 1 mm and length 200 mm? b) If the volume flow velocity of blood though these arteries is 1.7 x 10^{-6} m^3/S. What is the pressure drop across the arteries?

(Consider the viscosity of blood = 3.5 x 10^{-3} N.S/m^2) [10 Marks]

b- Compare between each two items of the followings: **(Answer four items only)**

[20 Mark]

(i) Resonance in basilar fiber for high frequency and low frequency.

(ii) Compton effect and photoelectric effect.

(iii) Resting membrane potential and action membrane potential.

(iv) Blood pressure in systematic and pulmonary systems.

(iiv) α-particles and β -particles properties.

Best Wishes

Examiners: Dr. Hosam Salah-Eldin Dr. Mohamed Saad-Eldin

Prof. Dr. Maher El-Tonsi Prof.Dr. Alaa Eldin El-koudry

Mansoura University		First Semester
Faculty of Science		January 2010
Dept. of Physics		Time allowed: 2hrs
2nd level Bio- Physics		Full Mark :80

Modern physics Phys.220

Final Examination

Answer the following Questions :

1-a-An optical signal with velocity vector v = c(cos θi + sin θj), where θ is the angle between the vector and the x- direction& i & j are the unit vectors in x-& y-directions respectively. Find the velocity of the signal at the system moves with a velocity 0.6c using both i- Galileo &ii- Lorentz transformations. [10] Marks

-b- An X-ray tube operate at 5 KV. Find the maximum speed of the electrons striking the target. [7] Marks

1-c- Determine the wavelength associated with an electron having kinetic energy = 1 MeV and rest energy 0.512 MeV. [10] Marks

2-a- Choose the correct answer : [10] Marks

i-According to plank's hypothesis, the oscillator may take (any energy value- only discrete energy values)are allowed.

ii-Form the spectral distribution of radiation from a blackbody at different temperatures .The position of the peak maximum in each curve shifts to(lower-higher) frequencies with increasing (frequency – temperature).

iii-When we compare between the experimental spectral distribution of radiation from a blackbody and the Rayleigh-Jeans law. The agreement between theory and experiment is good at(lower-higher)wavelengths. The disagreement at higher frequencies will be(very small- infinitely large).

2-b- The wavelength of the incident photon in Compton scattering is 0.4 nm. If $\sin\varphi/2=0.5$. Calculate the wavelength of scattering radiations. Given incident photon wavelength 4nm. [10] Marks

2-c- Show that the probability density is always real and positive quantity. [6] Marks

3-a-A particle constrained to move along x-axis in the region $0\leq x\leq a$ has a normalized wave function $\psi(x)=N \sin n\pi x/a$;where n is an integer. Find the normalization constant N. [7] Marks

3-b- Define: i- uncertainty principals, ii- threshold frequency, iii- deBroglie wavelength iv- line & continuous X-rays spectra. [10] Marks

3-c- Ultraviolet light of wavelength 360 nm falls on potassium surface has a workfunction2eV.Determine: i-threshold frequency, ii-maximum energy of photoelectrons &iii-stopping potential. [10]Marks

With our best wishes for all to success,

Dr. S.M.Abdel-Maksoud & Dr. N.El-Shishtawi

المستوى الثانى - بحوث الفيزياء - الفيزياء الحيوية - اهتزازيات وموجات

Time allowed: 2 h Jan. 2010	first Term Exam For 2nd year physics, biophysics and geology Waves and vibration	Mansoura university Faculty of Science Physics Department

Answer all Questions

1-a)	Find an expression for the apparent frequency at a detector, if the source moves with a velocity U away from the detector.	10 marks
b)	Define the reflectance coefficient of a wave and prove that it depends on the density per unit length.	
2-a)	Prove that the velocity of wave in a gas depends on the pressure and the density per unit length and verify that the propagation of sound wave in air causes adiabatic changes.	
b)	Find the condition to obtain a straight line of negative slope as a result of superposition of two Perpendicular waves.	
3-a)	Prove that the amplitude of the perfect damping oscillation depends on the time.	
b)	Find the normal mode of oscillation of a rod free at one end and fixed at the other when a wave Propagates in this rod.	

Mansoura university Faculty of Science Physics Department		first Term Second Year: Biophysic Date: jan. 2011 Allowed time: 2 hours
Exam: Electricity in Bio-systems Code:210		Full Mark: 80 Marks

Answer The follwing Questions:

1- a) **Draw and explain the electric circuit equivalent to a neuron and show how it transmits a pulsed input to its output .**

b) The Zener diode used in the regulator circuit of figure (1) has the following data : I_{zk} =1 mA , I_{zM} = 540 mA , r_z =3 ohms and (V_z=15 volts at I_{zT}=160 mA) .Determine the output voltage V_{out} at I_{zk} and at I_{zM} then, determine the minimum value of R_L that can be used .

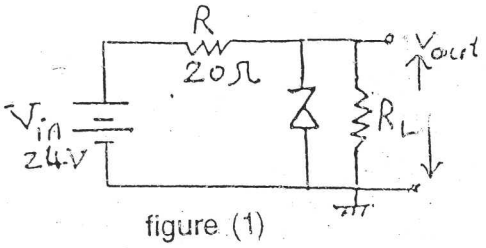


figure (1)

2-a) Derive an expression for the voltage gain of the inverting operational amplifier.

b) Determine the overall minimum and maximum gain of the two stage amplifier circuit shown in figure (2), where $R_1 = R_3 = 33$ K, $R_2 = R_4 = 8.2$ K , $R_{C1} = R_{C2} = 3.3$ K , $R_E = 1$K , $R_{E1} = 60\,\Omega$, $R_{E2} = 0$ To 940 ohm & $\beta_{dc} = \beta = 175$

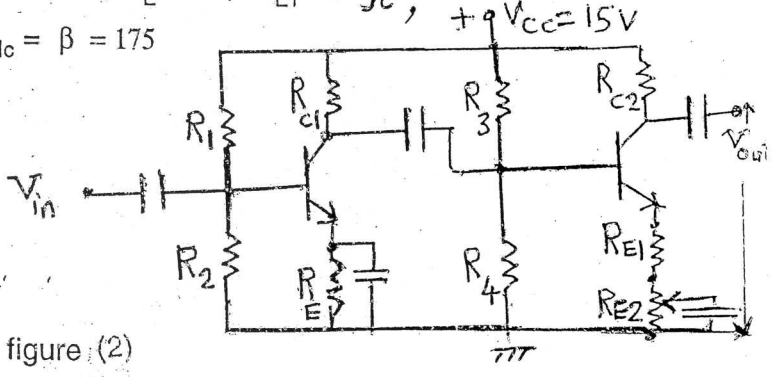


figure (2)

3 - a) Derive the condition required for stable biasing of the transistor circuit shown in figure (3) .

b) Derive an expression for the output voltage of the operational amplifier circuit in figure (4) ,then determine the value of R which make the output voltage equal the average value of the input voltages .