المستوى الثانى كيمياء حيوى - الأحماض النووية والبروفينات لعام ٢٠١٤

Mansoura University Faculty of Science Chemistry Department Subject: Chemistry Course(s): Chemistry of Nucleic acids- Prophyrins and their chemical applications	كلية العلوم جامعة المنصورة	First Term Date : Jan, 2014 Time Allowed: 2 hours Full Mark: 80 Marks

Answer The Following Questions

1. Give an account about the properties for an ideal sensitizer for PDT. Show also advantage and disadvantage of ALA-PDT

2. a) Write about measures to increase efficacy of PDT.

   b) Write down the biosynthetic pathway of purines.

3. Show how pyrimidines are biosynthesized

مع تحياتى ،،،

أ.د محمد عبد الحافظ الفار
أ.د حسين غالب عثمـــان

المستوى الثانى - كيمياء

كيمياء صيون - أسئلة مدخل إلى الكيمياء التحليلية لـ ١١

Mansoura University Faculty of Science Chemistry Department Subject: Analytical Chemistry Course: **Titrimetry (Volumetry)** Course code:Chem (211)		2 nd level(Chemistry) Date:21/1/ 2014 Time allowed:2 hours Full Mark:60 Marks

Choose Four Questions only From The Following

Question 1.

i) Calculate the mean, confidence limit of five determinations 57 ,57.5 ,55 and 61 (s = 0.02 , Qt =0.05). Does the value 61 rejected or not?

ii) Number of moles of 5.8 g NaCl = ..., when dissolved in 500 ml, the solution has molarity of .....(At.wt Na=23 Cl=35.5)

iii) Calculate the volume of conc. nitric acid, having sp. gravity 1.42 and 69% w/w percentage concentration, required to prepare 1.00L of 0.20 M HNO3. What is the volume of the prepared acid needed to react quantitatively with 0.0106g of Na_2CO_3 (H= 1.00, N=14.00, O= 16.00, Na=23.00, C=12.00).

Question 2.

i)In determination of copper in copper coin,0.7g of it was dissolved in 10ml HCl And enough KI was added, the librated I_2 was titrated with 0.4M of $Na_2S_2O_4$,The volume needed was 25ml.Find the purity percent of the copper sample.Cu=63

ii) Calculate the pH of 50ml of 0.1M CH_3COOH on addition of the following volumes of 0.05M NaOH:

a) 0.0ml b) 5ml c) 100ml d) 120ml

Knowing that ($Ka_{CH3COOH}$= $1.8x10^{-5}$, pKa= 4.76)

Question 3.

Discuss:-

i- Factors affecting the break on precipitation titration curve.

ii- The relationship between solubility product and the solubility of a salt.

iii- Methods used for Fe(II) determination(2methods).

Question 4.

i) Define the following:

a) accuracy and precition

b)Zimmermann Reagent in $KMnO_4$ Titrations

c) Self indicator.

d) Nernest equation in Redox Reactions

ii) In titration of Fe^{2+} in acidic medium with 0.0206M $K_2Cr_2O_7$, volume of $K_2Cr_2O_7$ necessary was 40.2ml according to the following equation:

$$6Fe^{2+} + Cr_2O_7^{2-} + 14H^+ \rightarrow 6Fe^{3+} + 2Cr^{3+} + 7H_2O$$

Calculate the weight of iron (in mg) ,(Fe = 56)

iii)-If you have 1M acetic acid and 0.5M sodium acetate .Caculate the necessary volumes from the two solutions to prepare 100ml buffer solution of pH = 4.

Question 5.

i) How can you prepare 40% HNO_3 solution from 96% HNO_3 ,d=1.495g/ml, assuming density of water= 1g/ml .

(ii) Comment on each of the followings statements:-

a) - The success of an EDTA titration depends upon the precise determination of the end point.

b) - The complexing action of EDTA is unselective.

C) - The detection of the end point of argentiometric titration. Give example.

Good luck

Prof. Dr Mohamed El Defrawy

prof.Dr. Magda Akl

المستوى الثاني - كيمياء حيوية - الأحماض الأمينية والبروتينات لعام ٢٠١٤

	Mansoura University Faculty of Science Chemistry Department
First Term Second Level Biochemistry Course Title: Biochemistry of amino acids and proteins Code No.: Biochemistry 273	January 2014 Date: 18/ 1/ 2014 Time allowed: 2 Hours Full Mark: 60 Marks

Answer the following questions

Q1: (30 Marks)

A- Mark true (√) or false (x) and correct the false one: (13 Marks)

1- At acidic pH and constant low ionic strength of salt solution, the solubility decreases.
2- α-Keratin is α–helical polypeptide chain rich in lysine and non-polar amino acids.
3- Mellon's test is characteristic for argininc.
4- The isoelectric point of a specific protein solution of different ionic strengths will be the same.
5- Denaturation of protein structure by salt ions caused by strong ionic interactions that disrupt H-bonding.
6- Collagen may present as gel in extracellular matrix and in vitreous humor of eyes.
7- Loops conformation is stabilized by hydrophobic interactions only with other portions of protein.
8- Proline and glycine are often present in the β-turn.
9- Collagen is a tetrameric fibrous protein similar to elastin in its structure.
10- Most enzymes and blood proteins are fibrous proteins.
11- Blood ceruloplasmin molecule stores 16 atoms of copper.
12- Helix-turn-helix is a motif used in DNA recognition.
13- Albumin is responsible for about 75% of osmotic effect of plasma because it constitutes slightly lower than half of plasma proteins by weight.

B- Choose the correct answer: (17 Mark)

1- Among these are the amino acids that disrupt the helix by ionic bonds or by electrostatically repelling each other, **except:**
a) Lysine. b) Arginine.
c) Proline. d) Aspartate.

2- Which of the following amino acids disrupt the –helical structure due to bulky side chains, **except:**
a) Valine. b) Cystine.
c) Isoleucine. d) Tryptophan.

3- Hemolysis of erythrocytes occurs when the surrounding fluid is……..
a) hypotonic solution. b) hypertonic solution.
c) isotonic solution. d) either hypotonic or hypertonic solution.

4- All these are medicinal applications of plasma proteins fractionation, **except:**
a) γ–globulin fraction injections. b) Fibrinogen injections.
c) Albumin fraction injections. d) globin fraction injections.

5- Plasma protein fractionation helps in these pathological conditions **except:**
a) Fibrinogenopenia. b) Meningitis.
c) Blood clotting. d) Low kidney function tests.

6- Which one of these characters is NOT from the peptide bond characters:
a) Nearer to the double bond. b) Nearer to the single bond.
c) Resonance between single and double bonds. d) Co-planar in nature.

7- All these salt ions salting out the system by strengthen the hydrophobic interactions, **except:**
a) NH_4^+. b) $N(CH_3)_3^+$.
c) HPO_4^{2-}. d) SCN^-.

8- Onc of these tests gives positive result with phenylalaninc:
a) Mcllon's. , Sakaguchi.
c) Xanthoproteic. d) Pauly's.

9- One of these is NOT metalloprotein .....
a) Ceruloplasmin. b) Catalase.
c) Ferritin. d) α-globulin.

10- Which of these is NOT from the properties of the β–configuration:
a) Parallel and anti-parallel polypeptides. b) Inter-molecular H-bonding.
c) Intra-molecular H-bonding. d) Twisting in alternating directions.

11- Quaternary structure results from aggregation of two or more polypeptide subunits held together by the following, **except:**
a) Disulphide bridges. b) Ionic bonding.
c) Hydrophobic interactions d) H-bonding.

12- One of these is the result of that the protein solution is a colloidal solution:
a) Tyndal effect. b) Variation in pH.
c) Bipolar nature. d) Optical activity.

13- The tertiary structure of protein is stabilized by the below forces, **except:**
a) Salt bridges. b) hydrogen bonds.
c) ionic bonds. d) disulfide bridges.

14- According to the Henderson-Hasselbach equation, pH=pKa + log[A-]/[HA].When the pH is 3 points higher than the pKa, the ratio of conjugate base to acid (i.e. [A-]:[HA]) is .....
a) 3:1 b) 1:1000 e) none of the above.
c) 1000:1 d) 1:100

15- When the pH = pKa, the ratio of conjugate base to acid is .....
a) 10:1 b) 1:10 e) none of the above.
c) 1:1 d) 1:1000

16) A weak acid.....
a) behaves according to the Henderson- Hasselbach equation. b) has a conjugate acid.
c) is protonated at a pH above the pKa d) completely disassociates in water.
e) None of the above

17- Which is NOT related to loops:
a) Provide portion of DNA binding proteins such as repressors and transcription factors.
b) Constitute epitopes for recognition and binding of antibodies.
c- Characterized by structural regularity.
d- In many enzymes bridge domains responsible for binding substrates.
e- Contain residues that participate in catalysis of many enzymes.

Q2: (12 Marks)

Complete the following:

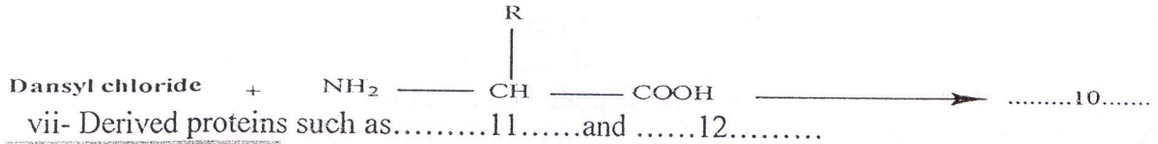
i- Octapeptides such as hormones.....1.....and .....2.....

ii- Glutathione is a tripeptide which is formed of .....3....,.....4.....and.....5.....

iii- In dialysis, the salt will flow through plasma membrane until.....6.....
At this point the flow will stop because.....7.....is reached. To enhance the remaining amount of salt to flow out of the dialysis bag .....8.....

v- .....9.....is a dipeptide acts as sweetening agent used in replacement of cane sugar.

vi-



vii- Derived proteins such as.....11.....and .....12.....

Q3: (18 Marks)

B- Give a brief account on the following: (illustrating your answer with drawing as possible)

i- β-turn. **ii-** Collagen diseases. **iii-** Motifs **iv-** Benzoylation reactions.
v- Sanger's reaction. **vi-** α1-antitrypsin. **vii-** Lipoproteins. **viii-** β-sheets.
ix- Effect of changing the pH on protein solubility.

With my Best Wishes *Examinar: Dr. Nivin A. S. Islam*

المستوى الثانى - مقدمة فى الفيزياء الحيوية ف ع ١١

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

First term 2013-2014
Date: 14-1-2013

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. A graded potential is a minor perturbations in membrane potential due to spontaneous ion leakage through cell membrane.	
		ii. Any change in membrane potential from -70 mV to -80 mV is called hyperpolarization.	
		iii. The dose equivalent measured in Sv and equals the absorbed dose in rad multiplied by quality factor.	
		iv. Glaucoma disease is characterized by a clouding of eye's natural lens.	
		v. The graded potentials last from 5 msec to several minutes.	
		vi. The electrical signals of the brain can be measured using electroencephalogram EEG.	
		vii. Hypermetropia caused by irregularity shaped cornea results in light focusing behind of retina	
		viii. X-rays can be deflected by electric field or magnetic field.	
		ix. The cornea of the eye contains the photoreceptors which are rods and cones.	
		x. The ear canal behaves like pipe that are open from both ends.	
	B-	Potential biological effects depend on how much and how fast a radiation dose is received. Differentiate between the acute and chronic radiation doses, explain your answer by different syndromes.	**[10 Marks]**
	C-	Calculate the velocity of blood through the capillaries inside the lung if you know the radius of aorta is 8 mm, the velocity of blood in aorta is 33 cm/sec and the total cross sectional area of capillaries is 2800 cm^2.**(Comment on your answer)**	**[5 Marks]**
2-	A-	**Complete the following sentences:**	**[each item = 2 Marks]**
		• The heart can be described as an ……(1)……dipole whose magnitude and direction varies in a ……(2)…… manner, repeating for each heart cycle.	

Please follow the rest of questions on the other side of this paper

		• The beta waves of EEG have frequency range .....(3)..... Hz in .....(4).....state.
		• X-rays are produced when rapidly moving .....(5)..... that have been accelerated through a potential difference of order 1 kV to 1 MV strikes a .....(6)..... .
	B-	Magnetic resonance imaging (MRI) is an imaging technique used primarily in medical settings to produce a high quality images of the inside of the human body. Discuss the physical principle of the magnetic resonance imaging (MRI) technique. **[10 Marks]**
	C-	Find an expression given for minimum wavelength and maximum frequency for X-ray tube operates at an accelerating voltage V. **[8 Marks]**
3-	**A-**	**Choose the correct answer :** **[each item = 1 Mark]**
		i. (Absorbed dose- Dose equivalent- Quality factor- Radiation flux) is a measure of energy deposition in any medium by any type of ionizing radiation.
		ii. The human eye is organ design to receive visible light having wavelengths between [(360 and 760 nm) – (380 and 670 nm) –(380 and 760 nm) –(390 and 660 nm)].
		iii. The X-rays emitted from the target is usually consisting of continuous radiation up on which (parallel-superimposed-straight-under) a line spectrum containing a relatively few lines.
		iv. About (64% -54%-44%-34%) of cone cells are red sensitive.
		v. The unit of the absorbed dose is called the (Gray-Sv-Rem-joule)
		vi. (Hypermetropia-Myopia-Astigmatism-Presbyopia) caused by irregularity shaped cornea results in light focusing in front of retina.
		vii. Myopia is corrected by (converging-diverging lens-cylindrical-flat) lens.
		viii. (Absorbed dose- Dose equivalent- Quality factor- Radiation flux) is number of particles or photons crossing an area of 1 square meter in one second.
	B-	Calculate the resistance per unit length of the fluids inside an axon of unmyleinated nerve and the resistance per unit area of the membrane, if the resistivity of the fluids inside the axon is 0.5 ohm-m, resistivity of membrane is 1.6×10^7 ohm-m , the axon radius is 5μm and the axon thickness is 6 nm. **[6 Marks]**
	C-	Each of three people talking, when speaking individually produce an unknown sound level L_1, but when they talk together, the sound level is 70 dB. Calculate the sound level L_1. **[6 Marks]**

Best wishes:

Dr Hany Kamal

Mansoura University Faculty of Science Chemistry Department Subject : Inorganic Chemistry Course(s): Representative Elements Code : Chem (221)		Summer Exam Second Level (Biochemistry) Students. Date : 11 January, 2014 Time Allowed: 2 hours Full Mark : 80 Marks

Answer The Following Questions

I. Give an explication of SEVEN ONLY of the following : **[28 Marks]**

1. The high (**1st IE's**) for (**$_4$Be, $_7$N and $_{10}$Ne**) and the low (**1st IE) for ($_8$O)**. .
2. The increasing of reactivity of alkali metals, with increasing of the atomic number, is demonstrated by their reactions with water.
3. **(Cs^+)** ion conducts electricity more than **(Li^+)** ion in the aqueous solutions .
4. Boron trioxide **(B_2O_3)** is amphoteric.
5. Carbon monoxide is a good reducing agent **whereas lead (IV) oxide** is fairly strong oxidizing agent in acid solution. **Support with an example** for each of both properties.
6. i) **Univalent thallium ($_{81}$Tl)** compounds are the most stable.
   ii) **Molten lithium** is very reactive substance.
7. **i)** White phosphorus shoud never be allowed to come into contact with body skin.
   ii) Aqueous solutions of **Be(II)** are acidic.
8. The trends of **both metallic character and stability of the lower oxidation state** on descending the **carbon group.**

II.A)Write on Five Only of the following, on the basis of the chemical reaction equations:

1. **Thermal decomposition methods** for separating elements. **[20 Marks]**
2. Both **Na_2O_2** and **KO_2** are used in self-contained breathing apparatus.
3. Isolation of the pure elemental **silicon** from **silica (SiO_2).**
4. Separation of aluminum metal from its **ore (bauxite) , AlO(OH).**
5. **Photodissociation** of nitrogen dioxide **(NO_2)** and **photochemical smog.**
6. Boric acid **$B(OH)_3$** is a monoprotic weak acid in water, the addition of a polyhydroxy compound makes **it** a strong monobasic acid.

II. B) Complete SIX ONLY of the following chemical reaction equations: [12 Marks]

1. $Ca(H_2PO_4)_2 + NaHCO_3 \xrightarrow{300°C}$
2. $Li_3N + D_2O \rightarrow$ &
3. $Al_4C_3 + H_2O \rightarrow$
4. $_7N^{14} + {}_0n^1 \rightarrow$ &
5. $Ca\,CN_2 + H_2O \rightarrow$
6. $Ca_3(PO_4)_2 + H_2SO_4 \rightarrow$ &
7. $P_2O_5 + H_2SO_4$ (Conc.) $\rightarrow$

III.A) Give an account on the following : **[13 Marks]**

1) Ortho and para Hydrogen.
2) Diamond and its structure, as an important allotropic form of carbon.
3) Isolation of the elemental **phosphorus** from its mineral phosphate rock **$Ca_3(PO_4)_2$.**

III.B) Describe the structure and nature of bonding of the following : [7 Marks]

1) Diborane (B_2H_6) & 2) Trimethylamine $(CH_3)_3N$ (At. numbers ($_1$H, $_5$B, $_7$N)

Best Wishes Dr. Abd-El-Latif Prof. Dr. Tawfik Rakha

المستوى الثاني - كيمياء - الكيمياء العضوية (ج) ٢٠١٤
كيمياء حيوي

Mansoura University Faculty of Science Chemistry Department Subject: Chemistry Course: Chem. 231 ***Basic Organic Chemistry II***	Second Term 2nd Level : Chemistry & Biochem. programs Date: 04 January, 2014 Time Allowed: 2 hrs Full Mark: **60** Marks

Question 1: *Select the correct answer.* **(20 Marks)**

Q-1: The name of this compound is :

a) *trans* 3,4-diethylheptane. b) *cis* 3,4-diethylheptane.
c) 3,4-diethylheptane. d) (*Z*) 3,4-diethylheptane

Q-2: The type of hybridization of carbon atoms in compound 1,2,3-trimethylene cyclopropane is:
a; SP ***b;SP^2*** ***c; SP^3*** ***d; Mix between SP and SP^2.***

Q-3 The following compounds one of them is present in cis/trans isomerism. Select it
a) CH_2=CH-$CHCl_2$ b) Cl_2C=CH-CH_3
c) CH_2=CCl-CH_2Cl d) ClCH=$CClCH_3$

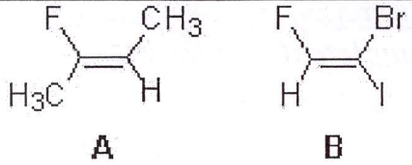
Q-4: What is the electrophile in the following reaction?

benzene + HNO_3 + H_2SO_4 ⟶ nitrobenzene

a) NO_2^+ b) NO^+ c) NO_3^+ d) $N_2O_2^+$

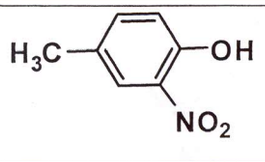
Q-5: Determine the double bond stereochemistry (*E* or *Z*) for the following molecules

a). **A**: *E*; **B**: *E* b) **A**: *Z*; **B**: *Z*
c) **A**: *E*; **B**: *Z* d) **A**: *Z*; **B**: *E*

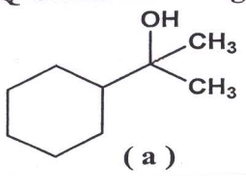


Q6: The compound which has the higher boiling point is: (Note The Molecular weight are the same)
a) Pentane ***b) Isopentane***
c) 1-butanol ***d)Tert. butyl alcohol.***

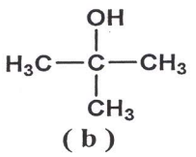
Q-7: The name of the following compound is:
a) 4-Methyl-2-nitrophenol **b) o-nitrohydroxtoluene**
d) 2-Nitro-p-methylphenol **d) 2-Methyl-4-nitrophenol**



Q-8:The following compounds one of them is consider secondary alcohol. Select it.

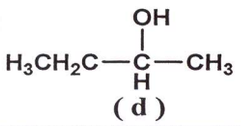


(a)



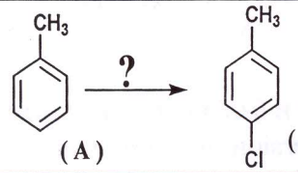
(b)

(c)

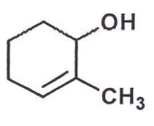


(d)

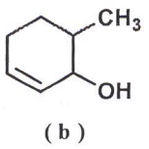
Q-9: The best reagent to prepare (B) from (A) is:
a; Cl_2 b; Cl_2/HCl
c; Cl_2/$FeCl_3$ d; Cl_2/ light



Q 10: One of the following compounds named 5-Methyl-2-cyclohexenol, select it



(a)



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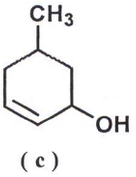
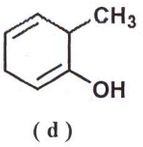


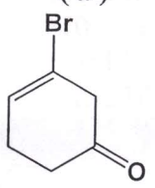
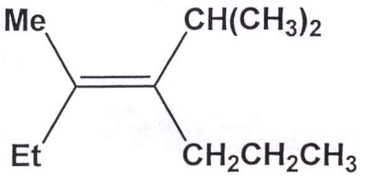
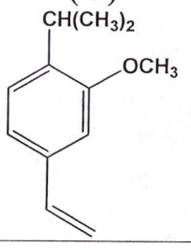
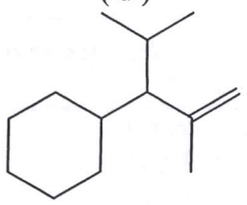
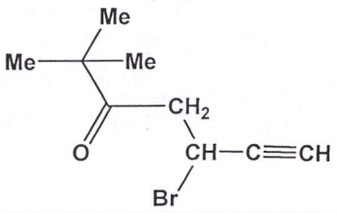
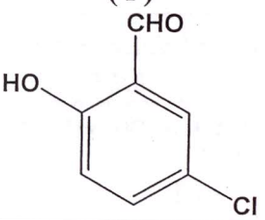
(c)



(d)

Question 3:. (20 Marks)

A; Give the IUPAC name of the following compounds:

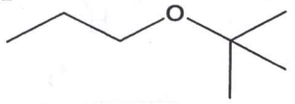
(a) 	(b) 	(c) 
(d) 	(e) 	(f) 

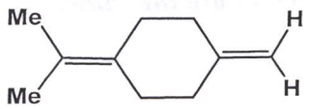
B; Draw the structural formulas and names for all possible structural isomers:

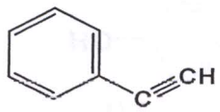
i) C_3H_6BrCl (ii) C_4H_8O.

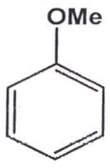
Question 3:. (20 Marks)

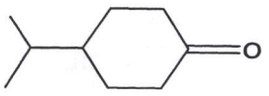
A; Complete the following reactions with a suitable mechanism:

1)  HCl (excess) →

2)  a; O_3 → b; $Zn/\overset{\oplus}{H}$

3)  $HgSO_4$ / H_2SO_4 →

4)  CH_3COCl / $AlCl_3$ →

5)  a; CH_3MgBr → b; H_2O / NH_4Cl

B; Write what you know about <u>two only</u> of the following:

i; Conversion of alcohols into alkyl halides.

iii; Reaction mechanism of addition HBr to propylene (in presence and absence peroxides).

iv; Activation and deactivation of monosubstituted benzene.

With Our Best Wishes

Prof. Dr. El-Sayed I. El-Desoky & Dr. Mona El-Sayed

المستوى الثالث - كيمياء حيوى - كيمياء الجزيئات الحيوية الليبيدات لوج ٢٧٤

Mansoura University
Faculty of Science
Chemistry Department
Subject: Chemistry
Course(s): Chemistry of Lipids

2nd Level Biochemistry Students
Date : Jan. 2014
Time Allowed : 2 hours
Full Mark: 80 Marks

ANSWER THE FOLLOWING QUESTIONS

I. **[30 Marks]**

a) Briefly explain membrane fluidity and phase transitions

b) Write the different nomenclature systems for the following fatty acids:

1. $CH_3(CH_2)_{17}CH_2COOH$
2. $CH_3CH_2CH{=}CH(CH_2)_{11}COOH$
3. $CH_3CH_2CH{=}CH(CH_2)_3CH{=}CHCH2CH{=}CHCH_2COOH$
4. $CH_3CH_2CH{=}CHCH_2CH{=}CH(CH2)_2COOH$

II. **[30 Marks]**

a) Lipidoses are a group of inherited metabolic disorders of lipids. Discuss and illustrate different types of lipid storage disease.

b) Define the following:

1. Chain-breaking antioxidants.
2. Body fat meter.
3. Acidity of fatty acids.
4. The geometric isomerism of unsaturated fatty acids

III. ***Put true or false in front of the following statements and correct the false ones.*** **[20 Marks]**

1. Lipid bilayers are usually composed of phospholipids, which have two polar heads and one hydrophobic tail.
2. In Cholesterol the methyl groups are attached to C10 and C13 are in the β-configuration.
3. Waxes are esters of fatty acids with higher molecular weight monohydric alcohols.

باقي الأسئلة في الخلف

Best wishes for our dear students,

Dr. Amr Negm

4. Glycolipids are esters of fatty acids and glycerol in addition to a carbohydrate moiety.
5. The melting points of even-numbered-carbon fatty acids decrease with increasing the number of double bonds.
6. The naturally occurred unsaturated fatty acids in fats are almost in the cis-form.
7. Lecithins have a saturated fatty acid in the sn-1 position, an unsaturated in the sn-2 position and ethanol amine in the sn-3 position of glycerol.
8. Lysophospholipids have a saturated acyl radical in the sn-2 position of glycerol.
9. Plasmalogens possess an ester link on the sn-1 carbon and a saturated acyl radical in the sn-2 position of glycerol.
10. Simple diffusion is the movement of lipid molecules across the cell membrane via special transport proteins.

Best wishes for our dear students,

Dr. Amr Negm

المستوى الثانى - كيمياء حيوى - ضوء فيزيائى ف ٢٢١

Mansoura University Faculty of Science Physics Department		**First Term Exam, 2014** **Second level** Date:**28-12- 2013** Time allowed : **2 hours** Full Mark: **80 Mark**
Subject: **Physics**		Course: **Physical Optics 221 ف**

Answer the Following Questions

[1] a -Demonstrate an explanatory diagram of the optical arrangement of Newton's rings. Discuss the forming of dark spot in the center of these rings. Derive the necessary formula of these ringes.

[15 Marks]

b - The disturbances produced at a given point by two coherent sources separately are given by;

$y_1 = a \sin \omega t$

and $y_2 = b \sin (\omega t - \delta)$.

Deduce an expression for the intensity at a given point when both the sources act simultaneously.

Show a plot of this intensity as a function of δ for the case where (a=b).

[12 Marks]

[2] a- Using Fresnel's biprism give an experiment to determine the refractive index of the thin sheet of a transparent material having thickness t. Derive the necessary formula. Explain why a white light is used in this experiment. **[15 Marks]**

b- A grating with 6000 ruling /cm is illuminated with white light at normal incidence. Describe the diffraction pattern for zero and first order assuming that the wavelength of light extends from (4000 A^o) to(7000 A^o).

[12 Marks]

[3] a- Discuss Fraunhofer diffraction pattern when using a rectangular slit. Derive an expression for the intensity distribution of the observed diffraction pattern . Show a plot of this intensity.

[18 Marks]

b- Drive the Malus law of the intensity of polarized light transmitted through the analyzer.

[8 Marks]

Good Luck

Examiners: Prof. Dr. Taha Sakkar & Prof. Dr. Karemal El -Farhaty

Prof. Dr. Eman Seisa & Prof. Dr. Mohamed Kabeel

المستوى الثاني - كيمياء حيوية - لوح ٢٧١ الكربوهيدرات والدهون

Mansoura university
Faculty of science
Chemistry Department
Subject : Biochem.271
Course : Biochemistry of carbohydrates

First Term Exam 2013/2014
Second Level BioChem Students
Date : 23 Dec. 2013
Time Allowed : 2 hours
Total Mark : 80 Marks

Q1: A) write briefly on the types and functions of the most important glucose transporters? (20 marks)

B) <u>Complete the following biotransformations:</u> (15 marks)

1- 3 H_2N-NH-ph + D - glucose →
2- Conc. HNO_3 + D-fructose →
3- Bromine water + oxygen + glyceraldehydes →
4- Hydrogen peroxide + dil.HNO_3 + D-glucose →
5- H_3PO_4 + ATP + D-galactose $\xrightarrow{\text{Hexokinase}}$

Q2: A) Write the structures and the important functions for each of the Following : (15 marks)

Compound	Structure	Functions
1. Trehalose		
2.Dextran		
4. Hyaluronic acid		
5. Sialic acid		
6-Chondroitin sulfate C		

B) Discuss the different types of Diabetes Mellitus? (10 marks)

PTO

Q3 : A) Write the structure of the following compounds: (12 marks)

1	Xylose	xylulose
2	Glucose	gulose
3	clellobiose	cellulose
4	InositoL	dulcitoL
5	α -L-glucopyranose	
6	methyl β-D-glucopyranoside	
7	α -D- fructofuranose	

B) Put (√) for write sentence and put (X) for wrong sentence: (8 marks)

1		Clellobiose is non-fermentable, indigestible and reducing compounds.
2		Glucose is an epimer to each of mannose and galactose.
3		Ribose and arabinose both gave erythrose on ruff-degradation.
4		Erythrose gave a mixture of ribose and arabinose on Killiani-Fischer synthesis.
5		Arabinose gave a mixture of glucose and mannose on Killiani-Fischer synthesis.
6		Ribose is an epimer to each of arabinose and xylose.
7		Sucrose is non-ozazone forming, not mutarotating and non-reducing sugar.
8		Amylopectin is the inner part of starch granules and is water soluble and give blue color with iodine.

GOOD LUCK **prof. Dr.A.F.Abdel-Aziz**