Mansoura University Faculty of Science Physics Department		**First Term Exam.** Date: **1-1-2012** Time allowed : **2 hours** Full Mark: **80 Mark**
Subject: **Physics**		Course: **221 ف Physical Optics**

Answer the Following Questions

[1]a- Demonstrate an explanatory diagram of the optical arrangement of Young's experiment on interference. Drive the theory of interference for this experiment. **[10 Marks]**

b- Explain how you can determine the thickness of a thin sheet of transparent material using Fresnel's biprism. **[8 Marks]**

c- Good fringes were observed with Michelson interferometer with monochromatic light, when the movable mirror is shifted 0.015 mm, a shift of 50 fringes is observed. What is the wavelength of light used. **[8 Marks]**

[2] a- Discus Fraunhofer diffraction using a rectangular slit. Drive an expression for the intensity distribution of the observed diffraction pattern. **[15 Marks]**

b- A parallel beam of monochromatic light is allowed to be incident normally on a plane spectra grating having 6000 lines/cm and a second order spectral line is observed to be deviated through 30^{o} Calculated the wavelength of the spectral line. **[12 Marks]**

[3]a- Explain with the necessary theory of interference in thin films due to reflected light. **[9 Marks]**

b- How can you obtain polarized light by refraction? **[9 Marks]**

c- In a Jamin's refractometer, two evacuated tubes each of length 20 cm are placed in the two beams. A gas at a known temperature and pressure is slowly and 100 fringes cross the centre of the field of view. Calculate the refractive index of the gas. (where the used source have wavelength $\lambda = 5460\ A^{o}$). **[9 Marks]**

Good Luck

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

المستوى الثانى - كيمياء حيوية - كيمياء الجزيئات الكبيرة للنبات

Mansoura University
Faculty of Science
Chemistry Department
Course Title : Chemistry of Lipids (272)

First Semester 2011-2012
Time Alowed Two Hours
Date: 13/1/2012
Course Code :Biochem 272

Answer the following questions: Full mark: 80 marks

Q1-A- Explain the schematic representation of types of transport system. (10 marks)

B- Write the sequence of steps that would be followed for one round of Lipid peroxidation. (10marks)

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Q2-A-Complete the following sentences (20 marks)

I. Kinks in fatty acid in fatty acid chains, due to—(1) --- interfere with – (2) --- in crystalline state, and – (3) --- the phase transition temperature.
II. Cholesterol inserts into bilayer membranes with its – (4) --- oriented toward the aqueous phase and its – (5) --- adjacent to fatty acid chains of phospholipids.
III. The inner mitochondrial membrane lacks –(6)--- but includes many phospholipids whose fatty acids have –(7)--- , which –(8)--- the melting point.
IV. Membrane rich in unsaturated fatty acids are more – (9) ---.
V. Membrane carbohydrates play an important role in—(10) ---.

B- Identify the following items: (13 marks)

I. Porins.
II. Integral protein.
III. Membrane potential.

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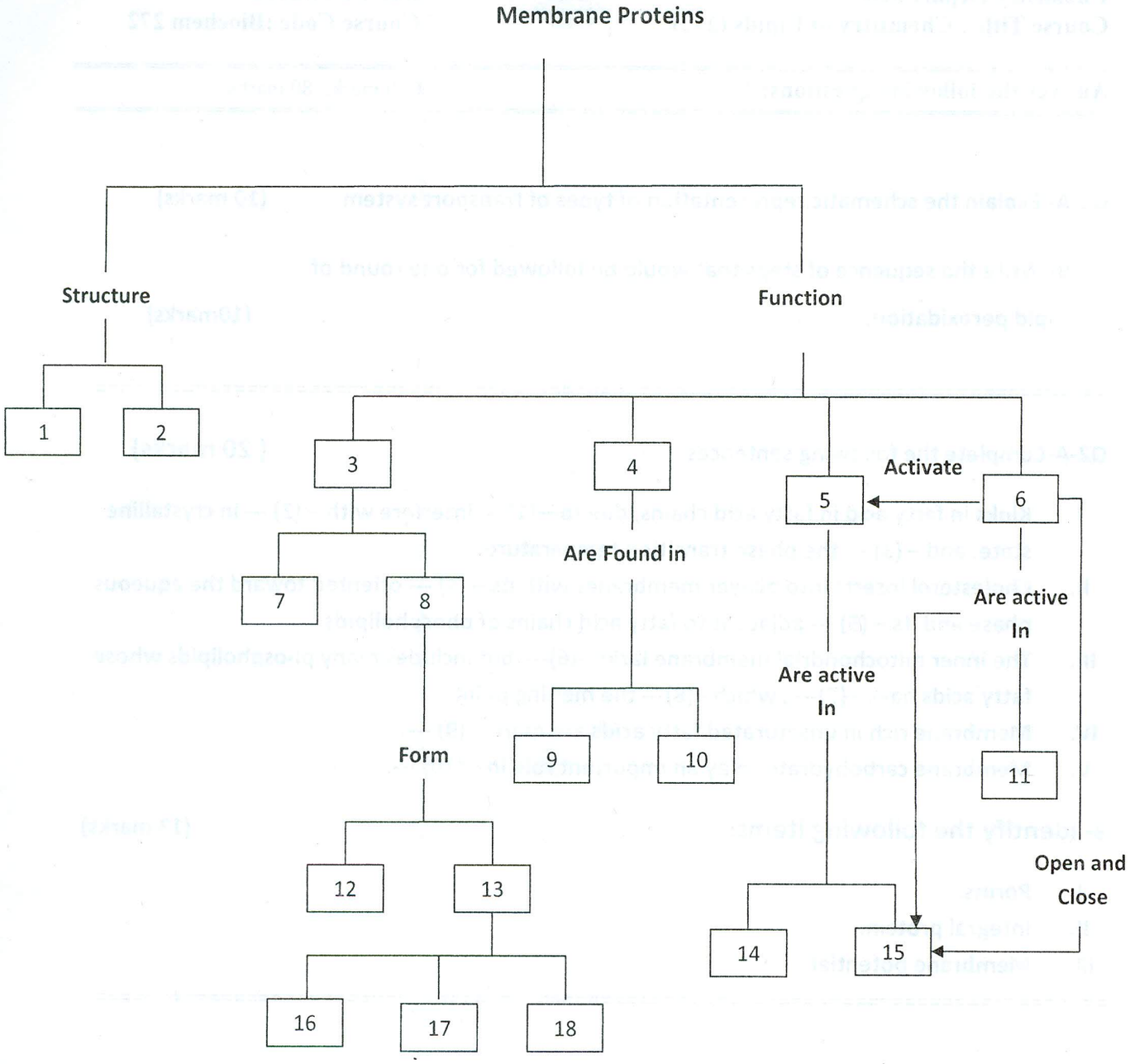
بقية الأسئلة فى ظهر الورقة

Q3- Complete the following diagram: (27marks)



Mansoura University
Faculty of Science
Department of Chemistry

First Semester
Date 15-01.2012
Time: Two Hours
Full Mark (60)

Exam. of Course 231(Principles of Organic Chemistry)
For 2nd Level (Chemistry Special and Chemistry/Biochemistry Students)

ANSWER THE FOLLOWING QUESTIONS

1- a-Alkenes can be converted to alkynes by bromination and two consecutive dehydrohalogenation reactions. Give mechanism with 1-butene**(10 Marks)**.

b- Carbocation rearrangements can occur upon the addition of H_2SO_4/H_2O to 3,3-dimethyl-1-butene to give 2,3-dimethyl-2-butanol as a major product. Explain with mechanism **(5 Marks)**.

c- Addition of HBr to 2-methylpropene gives only *tert*-butyl bromide, while the addition in the presence of peroxides gives anti-Markovnikov addition. Explain with mechanism **(5 Marks)**.

2- a- Based on the study of the Grignard synthesis, show how can you prepare 3-phenyl-3-pentanol **(10 Marks)**.

b-Methyloxirane undergoes ring opening with sodium ethoxide. Give the products **(5 Marks)**.

c- Acetaldehyde dimerizes in the presence of dilute sodium hydroxide at room temperature, the product is called an aldol. Explain with mechanism **(5 Marks)**.

3- a- The Friedel-Crafts reaction of benzene with 2-chloro-3-methylbutane in the presence of $AlCl_3$ occurs with a carbocation rearrangement. What is the structure of the product? **(10 Marks)**

b- Explain the mechanism of the electrophilic bromination of benzene **(5 Marks)**.

c- The addition reaction of bromine is used as a test for alkenes because the red color of the bromine reagent disappears when an alkene is present. Explain with mechanism **(5 Marks)**.

Good Luck

Prof.Dr. Mohamed Abbas Metwally and Prof.Dr. Sayed El-Desoky

المستوى الثاني - جيولوجيا + مجموعة البيولوجي . كيمياء العناصر الممثلة (ك ٢٢١)

Mansoura University Faculty of Science Chemistry Department Subject: Chemistry Course(s):Inorganic Chemistry, Chem 221	كلية العلوم جامعة المنصورة	First Term 2nd Level (Geology, Microbiology, Botany, Environmental, Zoology/ Chem) Date : Jan. 2012 Time Allowed: 2 hours Full Mark: 80 Marks

Answer the Following Questions

1- Comment on (10 only) of the following: (30 Mark)

1. Liquid hydrogen is used as fuel in large booster rockets.
2. BF_3 is Lewis acid
3. White phosphorous should never be allowed to come in contact with the skin.
4. Lithium is similar to magnesium.
5. Group II elements are heavily hydrated than group I elements.
6. Calcium dihydrogen phosphate is used in food industry.
7. Nitrogen oxides are poluttants.
8. The great reactivity of F_2.
9. Photochromic eye glass is made by adding a small amount of AgCl.
10. H_3PO_2 is a strong reducing agent.
11. Aqueous solutions of Be(II) salts are acidic.
12. Cs^+ conducts electricity more than Li^+ in aqueous solution.
13. Malathion has a great effect on insects rather than human.

P.T.O

2. Complete <u>10 only</u> of the following equations: <u>(30 mark)</u>

1. $CH_4 + H_2O_{(g)} \rightarrow$
2. $2NaCl$ (electrolysis /$CaCl_2$)$\rightarrow$
2. $CoO + B_2O_3 \rightarrow$
3. $Na_2O_2 + CO_2 \rightarrow$
4. $HF + SiO_2 \rightarrow$
5. $CaCN_2 + 5H_2O \rightarrow$
6. $CuO + NaH \rightarrow$
7. $2KClO_3 + MnO_2$ + heat $\rightarrow$
8. $CaF_2 + H_2SO_{4\ Conc.}$ – ....
9. $NaCl_{(aq)} + CO_{2(g)} + NH_{3(g)} \rightarrow$ .....
10. $H_3BO_3 + H_2O \rightarrow$
11. $B_2O_3 + P_2O_5 \rightarrow$

3. Try on <u>(4 only)</u> of the following: <u>(20 Mark)</u>

a. Contact process for production of H_2SO_4

b. Structure of B_2H_6.

c. Ostwald process for the production of HNO_3.

d. Allotropy of Carbon

e. Ortho- and para hydrogen.

f. Isolation of silicon in pure form

Mansoura University
Faculty of Science
Chemistry Department
Subject: Chemistry
Course (s):211

First Term
Level (2).
Date : 2011Time
Allowed : 2 hours
Full Mark : 60 Marks

ANSWER THE FOLLOWING QUESTIONS :

I) Briefly discuss, Give an example. :

1-The theory of visual use of metal ion indicators .
2-Factors affecting the inflection in titration curves.
3-Oxidation reduction reactions in titerimetric analysis .
4-Analysis the simple mixtures by using EDTA .

II) Compare between Mohr's ,Volhard's.

III) from the following weak acids ., which is the strongest ;

i- Propionic acid , Ka=1.34x10-4
ii-Citric acid ,Ka=8.2x10-4
iii-Acetic acid , Ka=1.78x10-5

VI) Calculate:

1-The pH of acetic acid in solution, which made by mixing 25 ml of 0.2 M HCl with 25 ml of 0.2 M sod.Acetate, (Ka =1.8 x 10- 5)

2-The pH of a 0.025 M HI solution at 25 C is _____.
a] 1.06 b] 1.60 c] 3.69 d] 4.12

3- Calculate the pH for a mixture of 200 ml of 0.1 N oxalic acid and 100 ml of 0.1 N NaOH. (Ka = 1.8×10^{-5}).

Please circle the best answer. 3 marks each

. In general, the smaller the K_a the easier it is to detect the endpoint.

a. True b. False

. In general, the more dilute the reagents in either an acid-base or a precipitation tration the easier it is to detect the endpoint.

a. True b. False

. To see the acid color of an indicator used in an acid-base titration, [Hin]/[In] must be:

0.10 b. 1.0 c. 10 d. None of these

. 50.00 mL of a monoprotic weak acid, HA, with 0.1000 M concentration is being trated with 0.2000 M NaOH. What is the pH of the solution after addition of 2.50 mL of base? $K_a = 5.00 \times 10^{-5}$

5.00 b. 4.30 c. 6.00 d. None of these

. The end point indicator used in the Fajan's Method is fluoroscein. It is a (an) ıdicator.

ı. acid-base b. adsorption c. complexometric d. none of these

. Whenever excess silver ion is added to the titration medium, followed by titration of the excess silver ion with SCN , the method is called the

a. Volhard Method b. Fajans Method c. Mohr Method d. None of these

. If 25.00 mL of 0.0500 M [Ag^+] is needed to reach a chromate endpoint in the determination of bromide, how many mmoles of NaBr must have been present in the titration medium.

.00125 b. .0500 c. 1.25 d. 5.00 e. Not enough information

. In a precipitation titration, the - - - the Ksp of the analyte-titrant precipitation product, the easier it is to detect the end point.

larger b. smaller c. magnitude of the K_{sp} doesn't affect ease of end point detection

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WITH OUR BEST WISHES

Prof. M. A. Akl

المستوى الثانى - مقدمة فى الفيزياء الحيوية (فع ٢١١)

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

First semester 2011-2012
Date: 22-1-2012

2nd Level students
برامج (فيزياء حيوية- ميكروبيولوجى- كيمياء حيوان-كيمياء -كيمياء حيوية -كيمياء نبات)
Full Mark: 80
Allowed time: 2 hours

Answer all the following questions:

			Marks
1-	a-	When an animal takes a step, the leg swing naturally from the hip bone, much like a pendulum in a gravitational field. Derive an expression for the time taken of a leg to swing once a time?	7
	b-	Define the following: Depolarization – Activity of a radioactive source - Hematocrit- Heat Flux	6
	c-	If you have 4 gram of pure ^{40}K emits $2x10^5$ β- particles/sec. Calculate the decay constant λ and half life time $t_{1/2}$? (Avogadro's number $=6.02x10^{23}$).	7
2-	a-	If we have 1 mole of glucose, How much energy will be produced during metabolism?	7
	b-	Calculate the photon flux at 1 m and 2 m from a Cs ^{137} gamma source of activity 800 MBq?	6
	c-	Describe with drawing the continuous and characteristic X-rays.	7
3-	a-	Derive an expression to calculate half life time of a radioactive source.	7
	b-	Write on resonant frequency and various sensations observed by humans subjected to variations of different frequencies.	6
	c-	Explain the physical concept to measure signals from the heart using electrocardiogram. Draw and explain an ECG chart?	7
4-	a-	Compare between α - particles, β- particles and γ-rays?	7
	b-	Discuss the basic principle of magnetic resonance imaging (MRI).	6
	c-	i. Calculate the capacitance per unit area of an unmyelinated axon of membrane thickness is $b = 6 \times 10^{-9}$ m knowing that the material in the axon membrane has dielectric constant K= 7 and $\varepsilon_o = 8.85\times10^{-12}$ s/ohm-m.	7
		ii. Calculate the number of elementary charges per m^2 if the charge is $1.6x10^{-19}$C and the potential difference =70mV.	

Best wishes:

Examiners: * د. هانى كمال د.محمد منصور د. نبيل قناوى

المستوى الثانى - كيمياء حيوية (ك ع ٢٧٤)
الأحماض النووية والبروفيرينات

Mansoura University
Faculty of Science
Chemistry Department
Subject: Biochem. 274
Course(s): Chemistry of Nucleic acids- Prophyrins and their chemical applications

First Term
Second Level (Biochemistry)
Date: 26th December 2011
Time Allowed: Two hours

Full Mark: 80 Marks

Answer ALL the Following Questions

[1] Write about the properties for ideal sensitizer and advantage of using PDT application . **[27Marks]**

[2] A- Show measures to increase efficacy of PDT. **[13 Marks]**

B-i- Give the Name and Draw the structural formula for each of the following compounds:

a- A purine base, in which a nitrogen atom replaces a heterocyclic ring carbon (C_8), is employed clinically in the treatment of cancer and some viral diseases.

b- A purine base containing thiol group is a metabolite of a drug used to supress events involved in immunological rejection during organ transplantation.

c- A 5-iodo derivative of a pyrimidine base is known as anti-viral drug.

d- A sulphur-containing pyrimidine is used to treat hyperthyroidism.

e- A pyrimidine nucleoside, in which arabinose replaces ribose, is used in the chemotherapy of cancer and viral infections.

[10] Marks

ii- Rewrite the following paragraph filling in the missing word(s):

Small quantities of additional purines and pyrimidines occur in DNA and RNAs. Examples include .....of bacterial and human DNA, ...of bacterial and viral nucleic acids, and mono-and .....and guanine of mammalian mRNAs.

[3] Marks

[3] A- The following is an mRNA transcript nucleotide sequence:

5′-pAUG UUA .....UGA-3′

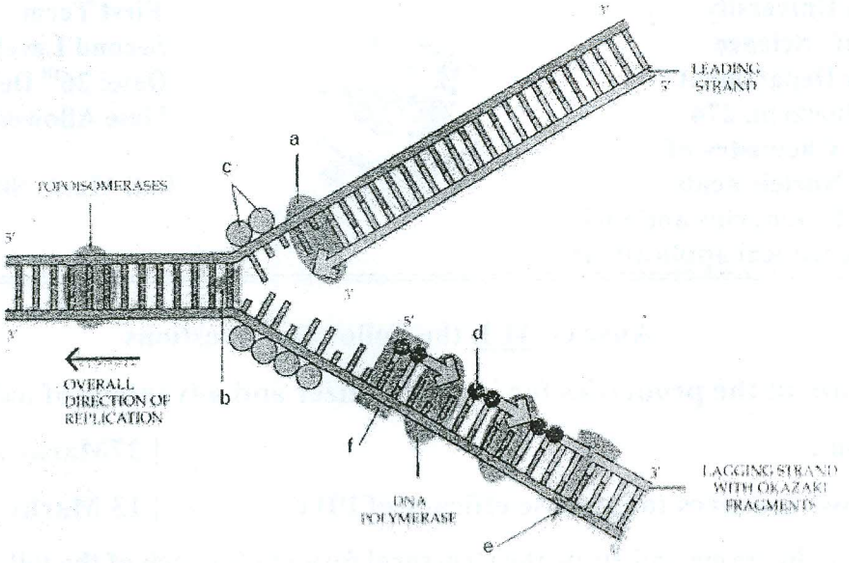
i- Sketch the first tRNA molecule to be involved in the protein synthesis process. [5] Marks

ii- Use the genetic code table(enclosed) to predict the second amino acid in sequence in the synthesized polypeptide chain and show how it is attached to its tRNA. [5] Marks

iii- Illustrate the translation process of the given mRNA molecule. [11] Marks

B- Identify a,b,c,d,e, and f in the following DNA replication process diagram:

تابع باقى الاسئلة بصفحة اخرى (بالكلف)



[6] Marks

The Genetic Code Table

First Position	Second Position: U	Second Position: C	Second Position: A	Second Position: G	Third Position
U	UUU Phe	UCU Ser	UAU Tyr	UGU Cys	U
	UUC Phe	UCC Ser	UAC Tyr	UGC Cys	C
	UUA Leu	UCA Ser	UAA End	UGA End	A
	UUG Leu	UCG Ser	UAG End	UGG Trp	G
C	CUU Leu	CCU Pro	CAU His	CGU Arg	U
	CUC Leu	CCC Pro	CAC His	CGC Arg	C
	CUA Leu	CCA Pro	CAA Gln	CGA Arg	A
	CUG Leu	CCG Pro	CAG Gln	CGG Arg	G
A	AUU Ile	ACU Thr	AAU Asn	AGU Ser	U
	AUC Ile	ACC Thr	AAC Asn	AGC Ser	C
	AUA Ile	ACA Thr	AAA Lys	AGA Arg	A
	AUG Met	ACG Thr	AAG Lys	AGG Arg	G
G	GUU Val	GCU Ala	GAU Asp	GGU Gly	U
	GUC Val	GCC Ala	GAC Asp	GGC Gly	C
	GUA Val	GCA Ala	GAA Glu	GGA Gly	A
	GUG Val	GCG Ala	GAG Glu	GGG Gly	G

مع تمنياتنا د. محمد الفار ، د. امجد السكري

المستوى الثانى - كيمياء حيوية - (الفرقة الثانية) كربوهيدرات - دور يناير

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

First Term Exam 2011/2012
Second Level BioChem Students
Date : 20 Jan, 2012
Time Allowed : 2 hours
Total Mark : 80 Marks

Answer the following questions
Provide your answer with formula, equations, pathways, figures or tables wherever possible

[1] **A) Complete the following biotransformations:** **(30 marks)**

1- HCN + D- glucose →
2- Conc. HNO_3 + D-fructose →
3- Bromine water + oxygen + glyceraldehydes →
4- Hydrogen peroxide + dil.HNO_3 + D-glucose →
5- Conc. H_2SO_4 + D-galactose →
6- Dilute alkali (under low heat condition) + D-glucose →

[2] **A) Give the structure and give ONE important function for each of the following:** **(15 marks)**

1-Sialic acid
2-Glucuronic acid
3-Saponins
4-Cellulose
5-Hyaluronic acid

B) What is the meaning of : **(15 marks)**

1- Galactosemia
2- Semen sugar
3- Mutarotation.
4- Racemic mixture
5- Deoxy sugar

PTO

[3] A) Put (√) for write sentence and put (X) for wrong sentence:(20 marks)

1- Stereoisomerism is molecules having the same structure but differ in position of their different groups ant atoms in the space.
2- Reduction of fructose gives sorbitol and mannitol.
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- Lactose is non-fermentable due to absence of lactase enzyme from yeast.
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.
9- Starch is the stored form of carbohydrates in animals.
10- Glucose transport via (gluT4) in the muscle cells and and adipocytes is not under the control of insulin.

Prof. Abdel-Aziz Fatouh