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

Second Semester Exam 2016
Second level Biophys.Students
Date : May, 2016
Time Allowed : 2 hours
Total Mark : 80 Marks

Answer the following questions

[1] A. Choose the correct answer: **(20 marks)**

1. Which of the following sugars is non-reactive to Benedict's reagent
   a. Sucrose b. Fructose c. Maltose d. Cellobiose

2. The glycosidic bond
   a. In maltose is not hydrolyzed b. In starch is hydrolyzed
   c. Joins glucose and fructose to form sucrose d. Both (b) and (c)

3. Which of the following is a structural nitrogenous heteropolysaccharides
   a. Chitin b. Inulin c. Hyaluronic acid d. Starch

4. Fructose and ribulose are considered to be
   a. Epimers b. Anomers c. Ketoses d. Functional group isomers

5. _____ produce sunflowers crystals with osazone test.
   a. Glucose b. Maltose c. Fructose d. Lactose

6. A keto pentose will have _____ sterioisomers.
   a. 4 b. 6 c. 8 d. 10

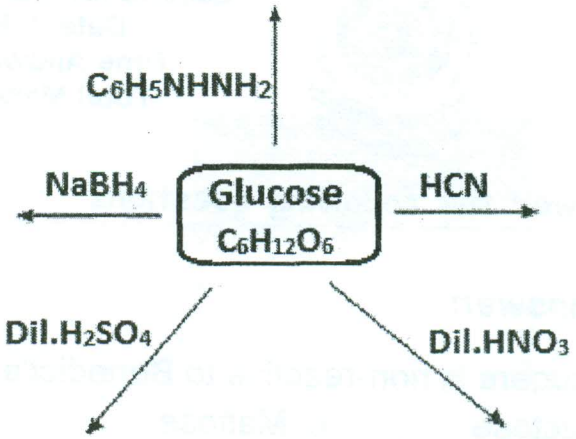
7. The furanose form of fructose is generated by formation of a hemiketal involving the attack of the hydroxyl group on carbon _____ with carbon _____
   a. 5, 2 b. 2, 5 c. 2, 6 d. 6, 2

8. Osazones are not formed with the
   a. Glucose b. Lactose c. Fructose d. Sucrose

9. Mannitol is a sugar alcohol derived from ----------
   b. Glucose b. Ribose c. Fructose d. Galactose

10. Lactose contains:
    a. galactose linked to glucose with a α-1-4 linkage.
    b. galactose linked to glucose with a β -1-4 linkage.
    c. glucose linked to galactose with a α-1-4 linkage.
    d. glucose linked to galactose with a β -1-4 linkage.

B. Complete the following: **(10 marks)**



[2] A. Put true (√) or false (X) with correction the false one(s): **(10 marks)**

1. Uronic acid are produced by oxidation of aldehyde group to carboxylic group.

   ( )
2. Enantiomers are isomers that differ in distribution of -H and -OH groups around the anomeric carbon atom carbon atoms. ( )
3. Oligosaccharides are carbohydrates containing many sugar units (greater than 10) linked together. ( )
4. Amino sugars result from replacement of -OH group of first carbon atom with amino group. ( )
5. All Disaccharides are considered to be fermentable sugars, while polysaccharides are not. ( )

B. Compare between: **(20 marks)**

1. Starch, glycogen, and cellulose.
2. Chondroitin sulfate A, B, and C.

[3] What is the meaning of: (Give an example) **(20 marks)**

1. Meso compounds. 2. Mucoproteins. 3. Ring isomerism.
4. Deoxy sugar. 5. Mucic acid

GOOD LUCK Dr. Manar Refaat

المادة: المعادلات التفاضلية الفرقة :الثانية الشعبة : فيزياء وفيزياء حيوى	كلية العلوم- قسم الرياضيات	امتحان دور مايو ٢٠١٦ الزمن: ساعتان ر ٤٠٤

أجب عن الأسئلة الآتية:

السؤال الأول:

(i) أثبت أن $Ax^2 + By^2 = 1$ هو حل للمعادلة $x\left\{y\frac{d^2y}{dx^2} + (\frac{dy}{dx})^2\right\} = y\frac{dy}{dx}$

(ii) حل المعادلة $x^2D^2y - 3xDy + 5y = x^2 \sin \ln x$

السؤال الثاني:

(i) حل المعادلة $\frac{dy}{dx} = e^{x+y} + x^2 e^{x^3+y}$

(ii) استخدم طريقة المؤثر **D** لإيجاد حل خاص للمعادلة $(D^3 - 5D^2 + 7D - 3)y = e^{2x} \cosh x$

السؤال الثالث:

(i) حل المعادلة $(x + y)(dx - dy) = dx + dy$

(ii) استخدم طريقة تغيير البارامترات لحل المعادلة $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = x e^x \sin x$

السؤال الرابع:

(i) حل المعادلة $(x + 2y - 2)dx + (2x - y + 3)dy = 0$

(ii) أوجد المجموعة المتعامدة مع مجموعة الدوائر $x^2 + (y - c)^2 = c^2$

تمنياتي بالتوفيق والنجاح إن شاء الله

د. مجدى برسوم

Mansoura University Faculty of Science Physics Department Subject: Physics		Second Term Second Year :Bio-Phys.& Physics Date : June 2016 Time allowed : 2 hours
Course Electrical Measurements & Instrumentation phys. **224**		Full Mark:: **80 Marks**

Answer **THE FOLLOWING** Questions:

[1] a- Classify the different sources of error, then discuss each of them . **[10] Marks**

b- What is the difference between accuracy and precision? **[5] Marks**

c- A circle of radius given by **r = (10 ± 0.2) cm**, Calculate:

i) The area of the circle.
ii) The limiting error.
iii) The percentage of limiting error **[5] Marks**

[2] a- A set of ten measurements were made to determine the weight of a lead . The weight in grams were: **1.570, 1.597, 1.591, 1.562, 1.577, 1.580, 1.564, 1.586, 1.550 and 1.575**. Calculate:

i)The arithmetic mean, **ii)**The standard deviation of the reading,
iii) The Probable error, **iv)** the variance. **[15] Marks**

b- Determine the resistor value required to use a **50 μA** galvanometer with an internal resistance of **250 Ω** for measuring **0 - 50 mA**. **[5] Marks**

c- What is the sensitivity of the galvanometer of problem (2-b)? **[5] Marks**

d- What is the full scale voltage that can be measured with a meter of problem (2-a)? **[5] Marks**

[3] a- A resistance is rated at **3200Ω** and the current flowing through it is **64 mA**.

i) Compute the power loss in the resistor.
ii) It was found that the resistance of the resistor was **0.2** percent greater than the specified resistance and the ammeter read **0.75** percent more than the true current. Determine the relative error in the computed power. **[5] Marks**

b- A potentiometer has a slide wire of **150 Ω** and its length **200 cm**. A standard cell of **1.018 V** is used for standardizing the potentiometer and the rheostat is adjusted so that balance is obtained when the sliding contact is at **100 cm**, and when using an unknown voltage source the balance is obtained at **160 cm** length.

i) Find working current of the slide wire and the rheostat setting.
ii) If the slide wire has divisions marked in mm and each division can be interpolated to one fourth, calculate the resolution of the instrument.
iii) The maximum voltage can be measured by the potentiometer.
iv) Find the unknown voltage. **[15] Marks**

C- . A CRT of an oscilloscope has an accelerating voltage of **1000 V** and parallel deflecting plates of **1.5 cm** long and **5 mm** apart. The screen is **50 cm** from the center of the plates. Find:

i) The beam speed.
ii) The deflection sensitivity of the tube.
iii) The deflection factor of the tube. **[10] Marks**

Charge of the electron = 1.6x 10^{-19} C, Mass of electron = 9.1x 10^{-31} Kg

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Examiners: 1- Prof. Dr. Ahmed Oraby 2-Prof. Dr. Allaa El Khodary

Mansoura University Faculty of Science Physics Department	Final exam. In physics May 2016	Subject :Thermodynamics Second level Biophysicsl students Time2 hours

Answer the following Questions

1-a) Describe Joule experiment and find the internal energy equation of an ideal gas if the temperature increases from T_1 to T_2 and C_v= constant

b) An amount of ideal gas its volume 1.751 m3, pressure 225 K N/m^2 and temperature 77°C expands at a constant pressure until its temperature becomes 27 °C, find the change in

1) work 2) internal energy 3) entropy 4) enthalpy

(r=380 Joule/ kgm k), C_p=1.01x10^3 Joule/ kgm k)

2 a) considering internal energy as a function of temperature and volume, prove that $C_p - C_v = \left[\left(\frac{du}{dv}\right)_T + P\right]\left(\frac{\Delta V}{\Delta T}\right)_P$ and find C_p-C_v for ideal gas using this equation.

b) Carnot engine operates as refrigerate between two temperatures 17°C and 0°C absorb 700 cal from this resvoir at 0C, find

1- the coefficient of performance

2- The quantity of heat rejected to the reservoir at 17 °C

3- How much work is done by the motor of the refrigerator

3 a) Using Maxwell's equations, deduce the first and the second TdS equations in terms of coefficient of volume expansion β and compressibility K

b) The Joule-Kelvin coefficient is given by $\mu = \frac{v}{Cp}(\beta T - 1)$, find μ for

1) Perfect gas

2) Gas obeying Van der Waal equation

Dr Anwer Megahed

Mansoura University
Faculty of Science
Zoology Department
Date: 25th May 2016
Time: 2 hrs.

Program: Biophysics

Z 225, Blood & Endocrine

Full Mark: 60 Marks

Answer All the following questions:

PART (I) Endocrine glands (30 Marks)

(I): A-Complete the following sentences. .....(10 Marks)

1- Endocrine gland consists of a group of ductless glands. Acts through chemical messenger called .....

2- ..... hormone can inhibit urine production, causes vasoconstriction leading to increased blood pressure.

3- Nervous system consists of the brain, spinal cord and nerves. Acts through chemical messenger called .....

4- ..... hormone Stimulates contractions of the uterus during labor.

5- ..... hormone decreases blood calcium levels by causing its deposition on bone

6- .. .. stimulate the kidneys and intestine to absorb more calcium, raising calcium levels in the blood.

7- Hormones of the Adrenal Medulla, Produces two similar hormones (catecholamine's) ..... & ....., these hormones prepare the body to deal with short-term stress.

8- The islets of the pancreas produce hormones ..... – allows glucose to cross plasma membranes into cells from beta cells & .....– allows glucose to enter the blood from alpha cells.

9- .....Produced by Graafian follicles or the placenta, Stimulates the development of secondary female characteristics

10..... Produced by the corpus luteum, Helps in the implantation of fertilized egg in the uterus

(I): B-True or false ..... (10 Marks)

a) Abnormal thyroid development; severe hypothyroidism causes mental retardation.

b) Hypersecretion of the adrenal cortex hormone, leading to Cushing's syndrome, cortisol is primary problem.

c) Diabetes insipidus is the condition of ADH deficiency.

d) Calcitonin (CT) is a single polypeptide chain consisting of 32 amino acids, synthesized in the Parafollicular cells in parathyroid gland.

e) Somatostatin has the ability of inhibiting the secretion of both insulin and glucagon by beta and alpha cells of the pancreatic islets.

f) Hyperglycemia results when alpha cells continuously secrete glucagon hormone.

g) Gonadal hormone production is regulated by hormones secreted by posterior pituitary gland.

h) Gastrin& cholecystokinin are hormones secreted by special cells in adrenal gland.

i) FSH aids in the maturation of ovarian follicles in females and sperm production.

j) Testosterone is responsible for growth and maturation of the uterus and fat distribution.

(II) Explain and Answer TWO only of the following questions. .....(10 Marks)

(i)- The most important glucocorticoid in humans is cortisol. It exerts various metabolic effects, which is generally catabolic. Cortisol also has potent pharmacological effects However; these effects are produced only by large doses (pharmacologic doses). Explain the Pharmacological Effects of cortisol?

(ii)- Secretion of hormones is closely controlled by three different ways: Explain and give one example for each type?

(iii)- The synthetic (chemical) steps of thyroid hormones.

تعليمات الاجابة
السؤال الاول (A): أكتب الجملة كاملة مع وضع خط تحت الكلمة التى تمت اضافتها وكتابة رقم الجملة بشكل واضح .
السؤال الأول (B): أكتب الحرف الدال على الجمله مع وضع علامة (V) أو علامة (X) قرين كل حرف فى جدول
السؤال الثانى : اشرح بالتفصيل اثنين فقط واستعن بالرسم كلما أمكنك ذلك.

Part II: Hematology 30 marks

(III) Answer the following questions: .....(15 marks)

1. **Describe the morphology and explain the function of lymphocytes:**
2. **List the different technique for plasma protein separation And Factors Affecting Electrophoresis**
3. **What is Low A/G mean?**

(IV) Answer the following items: ..... (15marks)

1. **What is hematopoiesis? Briefly outline Erythropoiesis and the main factors affecting this process.**
2. **Illustrate the main mechanism of a blood clot formation.**

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Best wishes

Prof. Dr. M. Amr El-Missiry & Prof. Dr. Maher Amer

Mansoura University
Faculty of Science
Botany Department
El-Mansoura, Egypt

جامعة المنصورة
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المنصورة - مصر

Final Examination in Botany
Second Term: May. 2016

Educational Year: Second Level **Program (Branch):** Biophysics
Subject: Bot (205) **Course(s): Biophysics and Photosynthesis**
Time: 2 hrs **Date**: 1 / 6 / 2016 **Full mark:** 60 **Question mark:** 20

Answer the following questions:

Q1- I- Choose the correct answer(s) (10 marks):

a- During the day time, the phytochrome will be:.....
i- 97% Pr and Pfr 3% ii- 97% Pfr and 3% Pr
iii- 50 % Pr and 50% Pfr iv- none of them

b- In energetically favorable reactions:.....
i-$\Delta G>0$ ii- Energy is produced
iii-energy is consumed iv-$\Delta G=0$

c- The main photosynthetic pigment is:.....
i-Chlorophyll b ii- Chlorophyll
iii-Carotenoids iv- Phycobilins

d- The water splitting enzyme is connected to:.....
i-Photosystem I ii-Photosystem II
iii-Cytochrome b_6f iv- Ferredoxin

e- The main macromolecule inside the cells is:.....
i-Protein ii-DNA
iii-RNA iv-Fatty acids

f- Sun light is considered as:.....
i-Wave ii-Particle
iii-Wave and particle iv- Quantum

g- The photosynthetic cells of the leaf tissue are:.....
i-Upper epidermal cells ii- Xylem vessels
iii-Plaside cells iv-Palisade and spongy cells

h- The sunlight that pass through green plant leaves will lose:.....
i-Blue spectrum ii-Red spectrum iii- green spectrum iv- All

i- Chlorophyll contains:..... However, Hemoglobin contains .....
i-Magnesium ii-Calcium iii-Sodium iv-Iron

II- Illustrate only two of the following items by figures (10 marks):

a- The structure of ATP synthase
b- The structure of photosystem
c- The structure of chloroplast

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Q2-I-Give reasons for the following items (10 marks):

a- The hydrolysis of ATP produces energy
b- The cell challenges the second low of thermodynamics
c- Chemi-osmotic coupling allow the cell to harvest energy
d- The long day plants needs long day periods for flowering

II- Write on (10 marks):

a-The universal features of the living cells
b-The different types of chloroplasts

Q3-I- What would happen if (10 marks):

a- The cell decided to produce ATP only in the light reaction of photosynthesis
b- An energetically unfavorable reaction is required in the cell
c- The special pair of chlorophylls want to restore lost electrons
d- Short day plant was subjected to long day
e- Long plant is growing beside short one

II- Briefly explain only two of the followings (10 marks):

a- The different strategies for the flow of sunlight energy during photosynthesis
b- Different types of photosynthetic pigments
c- The differences between chloroplast and mitochondria

Best wishes,
Dr. Amr M. Mowafy

Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology
Course: Cell communication (Z- 223)

2nd level Biophysics
Date: 18/5/2016
Time Allowed: 2 hrs
Full Mark: (80 marks)

I) Write (True) or (False): (30 marks, 1 mark each)

1) phospholipids are one of the main components of the extracellular matrix ( )
2) Healthy cells at resting state tends to have high concentration cellular Na^{+2} concentration ( )
3) The ion channels of the cell membrane is consists mainly of cholesterol ( )
4) Connexon is the structural unit of septate junction wich is essential for cell survival ( )
5) The main function of Na^{+}/glucose antiport pump is to absorb intestinal glucose ( )
6) Receptor dimerization is the main step in activation of integrin cell signaling ( )
7) Cytoplasmic receptors are the type of receptors binding to lipophilic hormones ( )
8) Binding of the acetylcholine to the Na^{+} channels is an example of Voltage gated ion channels ( )
9) Absorption of amino acids is improved by alteration of desmosomes ( )
10) cGMP is the active subunit involved in NO signaling in smooth muscles ( )
11) Proteoglycans are one of the main components of the extracellular matrix ( )
12) The ion channels of the cell membrane is consists mainly of integral proteins ( )
13) Angiogenesis is critical factor involved in cancer initiation ( )
14) The permeability of gap junctions can be regulated only by cell Ca^{+2} concentrations ( ).
15) Receptor of steroid hormones is an example of intracellular receptors ( )
16) Disulphide bonds is essential for selectins to do their function of cell-cell adhesion ( )
17) Gα is the main active subunit of GPCR responsible for its signaling ( )
18) The main function of the cell receptor Integrins is to regulate RTK ( )
19) cAMP is considered as one of the cell signaling lipophilic 2_{nd} messengers ( )
20) Cell membrane cholesterol is essential for cell membrane bilayer structure ( )
21) Binding of the acetylcholine to the Na^{+} channels is an example of Voltage gated ion channels ( )
22) Claudins are the major transmembrane proteins in occluding junctions ( )
23) Absorption of amino acids is improved by alteration of gap junctions ( )
24) Focal adhesion are the connecting site between cell and extracellular matrix ( )
25) Keratin filaments are the cell cytoskeleton largest fibers involved in cytoplasm streaming ( )
26) Exposure to Ultraviolet Lights are considered as tumor promoter ( )
27) Hearing of sound waves is an example of mechanically gated ion channels ( )
28) Dysplasia is an increase in number of cancer cells ( )
29) Na^{+} is more permeable through cell membrane than Urea ( )
30) Alteration of hemidesmosomal functions leading to accumulation of water under the skin ( )

II) Choose and write down the letter of the right answer (20 marks, 2 marks each)

1) The function of ..... Protein is to connecting cells at cell-cell junctions

a) Cadherin b) Integrins c) Hemidesmosomes

2) The main function of ..... junction is to seal cell-cell membrane barrier

a) Tight b) Gap c) Adheren

3) Cancer tumor of connective tissue origin is called

a) Sarcoma b) Carcinoma c) Blastoma

4) Focal adhesion junctions are the attachment sites for

a) Actin microfilaments b) Keratin filaments c) Intermediate filaments

5) The drug Viagra is working by increasing the blood level of .....

a) cAMP b) cGMP c) cATP

6) ..... is essential for endothelial cell survival

a) E-cadherin b) N-cadherin c) VE-cadherin

7) ..... Is the main ligand of the cell receptor integrin.

a) Collagen b) laminin c) Fibronectin

8) Swelling of RBCs is an example of placing RBCs in ..... solution.

a) Hypotonic b) Hypertonic c) Isotonic

9) Which of the follows is more permeable through cell membrane at resting membrane state.

a) Co_2 >Urea> Na^+ b) Urea> K^+ > Cl^- c) K^+ > Cl^- >Urea

10) .....are the building units of cilia and flagella.

a) Microtubules b) Microfilaments c) Intermediate filaments

III) Write short notes on <u>Three</u> of the follows: (30 marks, 6 marks each)

1) Forms of extracellular signaling

2) Facilitated diffusion of ions

3) Structure and function of cell adhesion molecule Cadherin.

4) Mechanism of action of Nitric Oxide in cell signaling at blood vessels

5) Hallmarks of cancer

Best Wishes

Prof. Nareman K. Badr-Eldin

Dr. Doaa Sakr

Dr. Elsayed K. Areda

Dr. Mohamed E. Abdraboh

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Final Examination in Botany
Second Term: May. 2016

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