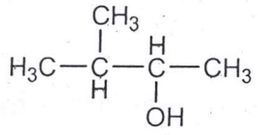
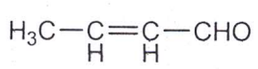
Mansoura University
Faculty of Science
Chemistry Department
Subject: Organic Chemistry

First Term
2nd year: Biology & Biophysics Student
Date: Sep. 2013
Time Allowed: 2 h
Full Marks: 60 Marks

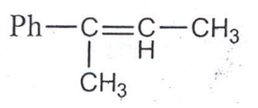
Answer the following questions:

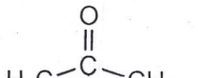
Q1- Complete the following equations: [20 marks]

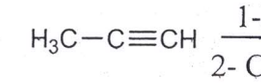
i-  conc. H_2SO_4 ⟶ .....

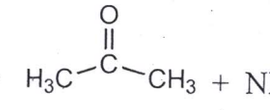
ii-  $NaBH_4$ ⟶ .....

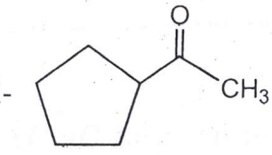
iii- Ph-CHO $\xrightarrow{NaOH}$ .....

iv-  $KMnO_4$ ⟶ .....

v- CH_3-Br + Mg ⟶ .....  .....

vi-  1-Na, 2- CH_3-Cl ⟶ ..... $\xrightarrow[H^{\oplus}]{HOH}$ .....

vii-  + NH_2-NH_2 ⟶ .....

viii-  I_2/NaOH ⟶ .....

ix- Ph-CHO + HCN ⟶ ..... $\xrightarrow[H^{\oplus}]{HOH}$ .....

x- CH_3-CH=CH_2 + Cl_2/H_2O ⟶ .....

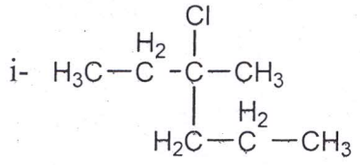
Q2: Illustrate the following: [20 marks]

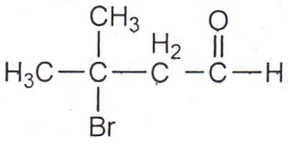
a) Draw the chemical structure of the following compounds:

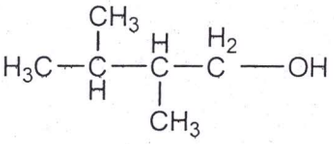
i- 3-bromo-1-butanol
ii- Isoheptyl alcohol
iii- 2-buten-1-ol

P.T.O ⟶

b) Write the IUPAC name of the following:

i- 

ii- 

iii- 

c) Draw all isomers and assign the type of isomerism in each of the following compounds:

i- 2-Butene
ii- $C_5H_{10}O_2$
iii- 1,2,3-Butantriol.

Q3- By chemical equations illustrate how to make the following conversions. [20 marks]

i- Ethylene to acetone
ii- Methyl bromide to acetic acid
iii- Ethanol to 2-propanol
iv- Acetone to 2-butanol
v- 2-Bromopropane to tert-butyl alcohol

With our best Wishes

Examiners:

Prof. A.A. Fadda, Dr. D.M. Ayad, Dr. M. Monier, and Dr. M. Elsayed

Mansoura University
Faculty of Science
Chemistry Department
Subject: Biochem. 271
Course(s): Chemistry of Biomolecules (Chemistry of Carbohydrates)

Summer Term
Final Exam
Second Level (Biophysics)
Date: 25th Aug 2013
Time Allowed: Two hours
Full Mark: 80 Marks

Answer ALL the Following Questions

[1] Complete the following sentences:

a- On reduction, glucose yields.... (1) ..... , galactose yields..... (2) .... , and .....(3)..... yields mannitol.

b- When a yeast is added to certain sugars, ...(4)..... is evolved and .....(5) ..... is formed.

c- Raffinose is a .....(6) ....., formed of .... (7) ...., ...(8) ..... , and .....(9) .....

d- ..... (10) ..... is the storage polysaccharide of animal body. It occurs in large amounts in ..... (11) ..... and .....(12) .....

e- Hyaluronic acid is present in the extracellular ground substance of ....(13)..... and acts as an .....(14)..... and is also abundant in ....(15) ..... in ...(16)... , and .....(17).....

f- .....(18)..... is a mucopolysaccharide with blood anticoagulant properties. It inhibits the transformation of .....(19)..... to .....(20).....

[20] Marks

[2] A- Draw the structural formula of each of the following compounds:

i- α-D-Galactose (Haworth formula).
ii- D-Fructose (Fischer projection).
iii- Maltose.
iv- Cellulose.
v- Chitin.
vi- Glycogen.
vii- Inulin.

[14] Marks

B- Illustrate with equations each of the following reactions:

i- Kilian's reaction for D-Glyceraldehyde.
ii- Osazone formation of D-Fructose.
iii- Fehling's reaction for D-Glucose.
iv- Ene-diol Reaction of D- Glucose.

[20] Marks

[3] Show the fate of Glucose in the human body under anaerobic conditions. Calculate the number of ATP molecules produced.

[26] Marks

Examiner: Dr. Ahmed EL-Sokkary

-Good Luck-

ج٤ /

المادة : معادلات تفاضلية (204) المستوى : الثاني (فيزياء + فيزياء حيوى) أستاذ المادة ا.د.على شمندى	كلية العلوم – قسم الرياضيات	دور صيف : ٢٠١٣ الزمن : ساعتان التاريخ : ١٨/٨/٢٠١٢

أجب عن الاسئله التاليه :

السؤال الاول: اوجد حل المعادلات التفاضلية التالية

(i $\frac{dy}{dx}\left[\sin^2\left(\frac{x}{y}\right)+\frac{x}{y}\right]=1$ (8marks)

(ii $(D^2-16)\,y=\sin^2x+7e^{3x}$. (12marks)

السؤال الثانى :

a) أوجد مجموعه المسارات المتعامدة مع المجموعه $x^2+(y-c)^2=c^2$ (10marks)

b) اوجد حل المعادله التفاضلية $(y'+1).Ln\left(\frac{y+x}{x+3}\right)=\frac{y+x}{x+3}$. (10marks)

السؤال الثالث:

a) استخدم التحويلات و التحويلات العكسية للابلاس فى حل المعادله التفاضلية :

$t\,y''(t)+y'(t)=4t^2\ ,\ y(0)=1\ ,\ y'(0)=0$ (10mark)

b) اوجد حل المعادله التفاضلية :

$\frac{dy}{dx}(x^2y^3+xy)=1$ (10mark)

السؤال الرابع :

اوجد حل المعادلات التفاضلية التاليه :

(a $\frac{d^2y}{dx^2}-3\frac{dy}{dx}+2=\frac{1}{x\,e^x}$ باستخدام طريقه تغيير البارامتر (10mark)

(b $(\tan^{-1}y)^6\,(x^3-6x^2+11x-6)\,dy+(1+y^2)\,dx=0$ (10mark)

خيرا جميل. ق ٢٦ ١١٠

Mansoura University
Faculty of Science
Physics Department

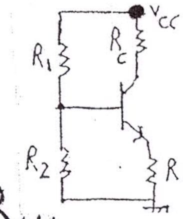
Course code: Biophys 210

Summer Term 2013

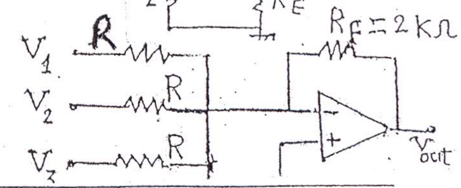
2^{nd} level Biophysics Students
Full Mark: 80
Allowed time: 2 hours
Course title:
Electricity in Bio systems

Answer the following questions: **(each question = 20 Mark)**

1- a- Derive the condition required for stable operating point of the transistor circuit shown in Figure (1a).

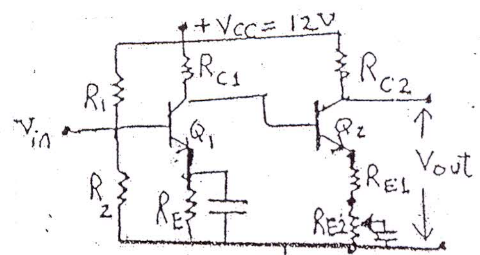


b- Derive an expression for the output voltage of the operational amplifier circuit in figure (1b), and then determine the value of R which makes the output voltage equal the average value of the input voltages.



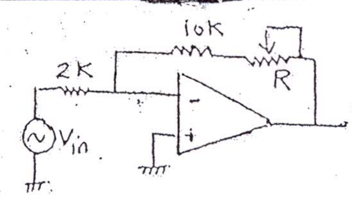
2- a- Derive an expression for the voltage gain of the non-inverting operational amplifier.

b- Determine the overall minimum and maximum gain of the two stage amplifier circuit shown in figure (2) where R_1=10 K, R_2=2.2 K, R_{c1}=3 K, R_E=350 ohm and Rc_2=1 k, R_{E1}=100, R_{E2}=0 to 900 ohm and $\beta_{dc}=\beta$=150.

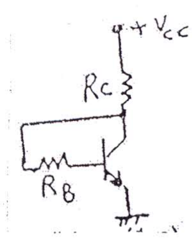


3- a- Derive an expression for voltage gain of the inverting amplifier

b- Determine the values of R in figure (3) which make the voltage gain of the inverting operational amplifier varies from -10 to -60.

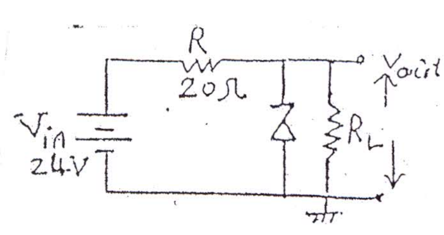


4- a- Derive the condition required for stable biasing of the transistor circuit shown in figure (4a).



b- The Zener diode used in the regular circuit of figure (4b) has the following data:

I_{ZK} =1 mA, I_{ZM} =540 mA, r_z=3 ohms and (V_{ZT} =15 volts at I_{ZT} =160 mA). Determine the minimum the output voltage V_{out} at I_{ZK} and at I_{ZM} then, determine the minimum value of R_L that can be used.



Best wishes:

Prof Dr Ahmed Oraby

فيزيا حيوية ع ٢٢١

Mansoura University
Faculty of Science
Zoology Department
Subject: وراثة خلوية
Course :ح221……….

2nd level- biophysics
Date:20-8-2013 ……..
Time: 2 hours
Full Mark: 60

Answer the following questions:-

Question 1 (20 Marks)

Answer only two of the following:

1- Describe the process of cell division by mitosis and illustrate by a labeled diagram.
2- Write on the numerical changes in chromosomes; Aneuploidy and polyploidy.
3- Report on Mitochondria structure and function.

Question2

Match A with B appropriately: (20 Marks)

A	B
aTurner syndrome	1-contains the chromosomes.
b.Diploid cells(2N)	2-leads the affected individual to have only 45 chromosomes
c. Nucleus	3-is a type of cell division by which gametes are formed.
d. Rough Endoplasmic reticulum	4- Function in the synthesis of protein in the cell
e. Lysosome	5- function in energy production
f. Polyploidy	6- is composed mainly of phospholipid molecules.
g. Meiosis	7- is a bundle of flattened sacs curled at the edges.
h. Mitochondria	8- have pairs of homologous chromosomes.
i. Lipid bilayer of PM	9- contains a variety of digestive enzymes.
j. Golgi apparatus	10- Possession of more than two sets of homologous chromosomes

Question 3 (20 Marks)

A-Complete the following sentences:

1- The transfer of a part of one chromosome to a nonhomologous chromosome is called……..
2-In meiosis, metaphase I is followed by ….. and ….
3-Cells of affected individuals with Down syndrome have ….copies of chromosome number…
4-The nucleus contains ……
5- Lysosomes are organelles that function in…….
6-The main function of smooth endoplasmic reticulum is ………
7-…………………… leads to a genetic disorder called cri-du-chat.
8- Mitosis occurs in …….cells while meiosis occurs in ……. cells.
9-Bacteria are made up of cells that lack…….
10-Endocytosis when transports liquid droplets into the cell it is called…….

B- Define the following terms:

Osmosis – Exocytosis - Karyotype – Cytosol – Centromere.

Best of luck

Prof.Dr. Nariman K. Badr El-Din