Mansoura University
Faculty of Science
Chemistry Department

Eductional Year: First level — Program: Chemistry & Biochemistry
Time: 2 hours — Course: Chem 121
Date: 2009 — Total mark: 60

Answer FOUR of the following questions (5 marks for a; b or c)

1- a) Nitrogen reacts with oxygen to form NO_2. If 8 g of N_2 reacts with 7.5 g of O_2, calculate the amount of NO_2. (At. Weights; N = 14; O = 16)

b) Draw Lewis structure for the following: ONF, CO_3^{--}, BF_4^-
(At. No.; O = 8, N = 7, F = 9, C =- 6, B = 5)

c) Which bond is more polar? i) N-O or C-O, ii) S-F or O-F

2- a) Calculate the wavelength (nm) of the line of Na when its last electron jumps to its fifth level. ($R = 109678\ cm^{-1}$)

b) Calculate the four quantum numbers for the last three electrons in Cl (At. No. = 17)

c) How many grams of oxygen (O_2) are needed to burn 5.6 g C_2H_5OH according to its balanced equation?

3- a) A compound containing by mass 40% C, 6.71%H and 53.3%O. What is the Empirical formula of this compound? A 0.32 mol sample of this compound weighs 28.8 g. What is the molecular formula of this compound?

b) Calculate the number of atoms of Fe in 0.89 g of Fe_2O_3

c) On the basis of molecular orbital theory (MOT), comment on the following: i) C_2 is paramagnetic while N_2 is diamagnetic
ii) O_2 is more stable than O_2^{--}

4- a) How many ml's of 0.2 M NH_4OH are needed to react with 12 ml of 0.55 M $FeCl_3$

b) On the basis of VSEPR, predict the shape of the following:
SCl_2, XeF_4, NH_3 (At. No.: S=16, Cl=17, Xe=54, F=9, N=7, H=1)

c) Write the electronic configuration of Cu (z=29) and deduce if it is stable and calculate the four quantum numbers of the last electron in Cu^{2+}.

5- a) Draw the resonance structure for N_2O and CO_3^{--}

b) What hybrid orbitals would be expected for the central atom in the following: CH_4 $BeCl_2$ SF_6
(At. No: C = 6, H = 1, Be= 4, Cl = 17, S=16, F = 9)

c) Comment on the basis of MOT i) Bond order of He_2 is zero
ii) NO^+ is more stable than NO.

Examiners: Prof Dr Ahmed Fawzy El-Asmy& Prof Dr Magdy Bekhiet

جامعة المنصورة كلية العلوم - قسم الرياضيات المادة: رياضيات أساسية تفاضل وتكامل (ر112)		امتحان دور مايو2009م الفرقة الأولي – المستوي الأول: برامج* الزمن: ساعتان - التاريخ:2009/5/27 الدرجة الكلية: 80 درجة

*برامج: كيمياء –وكيمياء ونبات – ميكروبيولوجي – كيمياء حيوي – جيوفيزياء – جيولوجيا – كيمياء وحيوان – علوم البيئة

أجب عن الأسئلة الآتية

السؤال الأول: (20 درجة – 5 درجات لكل جزء)

(أ) أوجد مجال تعريف ومدي الدالة $f(x)=\sqrt{4-x^2}$

(ب) أوجد معكوس الدالة $f(x)=\dfrac{3}{2x-5}$

(ج) أوجد النهاية $\lim\limits_{x\to 1}\left[\dfrac{2}{1-x^2}-\dfrac{1}{1-x}\right]$

(د) أوجد النهاية $\lim\limits_{x\to 0}\dfrac{3^x-1}{x}$

السؤال الثاني: (20 درجة)

(أ) أوجد $\dfrac{dy}{dx}$, إذا كانت $y=\dfrac{(1+x)^5\sqrt{x^3+2}}{(x-1)^3(x^2+1)}$ [6]

(ب) أوجد قيمة الثابت A , بحيث تكون الدالة $f(x)=\begin{cases}\dfrac{x^2-4}{x-2} & x\neq 2\\ A & x=2\end{cases}$, متصلة عند $x=2$ [6]

(ج) أوجد معادلتي المماس والعمودي للمنحني $y=f(x)=\sqrt{2x+1}$, عند النقطة $(4,3)$. [8]

السؤال الثالث: (20 درجة- 5 درجات لكل جزء):

أوجد المشتقة الأولي $\dfrac{dy}{dx}$ لكل من الدوال الآتية:

(أ) $y=\operatorname{sech}\left(\cos^{-1}2x\right)$

(ب) $\cos(xy)=y^2+x$

(ج) $y=2\ln(\cot t),\ x=\tan t+t^3$

(د) $y=x^{\sec x}$

السؤال الرابع: (20 درجة- 5 درجات لكل جزء):

احسب التكاملات الآتية:

(أ) $\int_1^2\dfrac{x^3-3x^2+1}{\sqrt{x}}dx$

(ب) $\int\dfrac{\sqrt{9-x^2}}{x^2}dx$

(ج) $\int xe^{5x}dx$

(د) $\int\dfrac{2x-8}{x^2-3x}dx$

مع أطيب أمنيات أسرة التدريس بالتوفيق

Mansoura University
Faculty of Science
Physics Department

جامعة المنصورة
كلية العلوم
قسم الفيزياء

Second Term Examination June2009

Academic Level: First Level
Time: 2 Hours
Subject: Electricity & Magnetism &Optics
Full Mark: 60 Marks

Program: Geo&Chem Zool&,Bio Chem,Bot,Enviro,Chem
Date: 6 June. 09
Courses: Physics 102

Answer the Following Questions

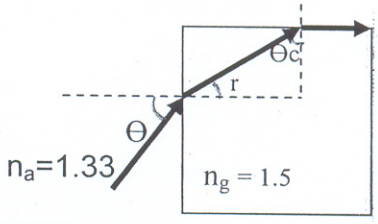
[1] a- Define the following terms: i - Refractive index , ii - Dispersive power, iii - wave front, iv - vergence , v - numerical aperture of optical fibers. **[5] Mark**

b- Through the electro static course, you obtained the electric field at a point located at a distance r from a positive point charge (Q) by different ways .Explain three methods of them in detail. **[10] Mark**

[2] a- Lens aberration is a problem facing the use of lenses. Explain how it occurs and the way to correct it. **[5] Mark**

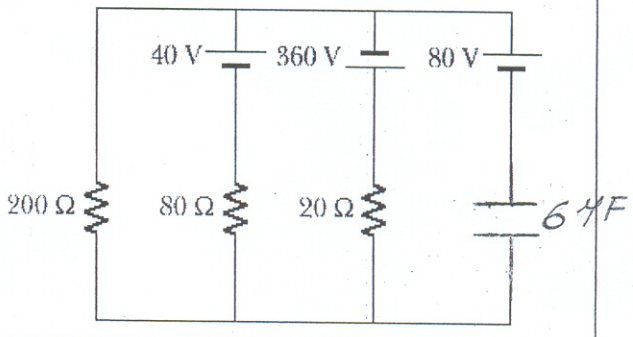
b- Explain how Pulfrich Refractometer can be used to measure the refractive indices of solids and liquids. **[5] Mark**

c- For the configuration and the data shown in the figure , use Snell's law of refraction to find the incidence angle Θ . **[5] Mark**



[3] a- Calculate the net torque τ on an electric dipole placed in a uniform electric field E ,where the dipole moment makes an angle Θ with the field. **[5] Mark**

b- In the circuit shown, determine the current in each resistor, after a long time of operation, and the energy stored in the capacitor. **[10] Mark**



[4] a- Define the following terms: i - Coulombs force, ii - Electric field, iii - Electric potential and electric potential energy difference, iv -Equipotential surface, v - Electric flux ,vi - Dielectric constant **[7] Mark**

b- An insulating sphere of radius ***a*** has a uniform charge density ρ and a total positive charge Q .Calculate the electric field at a point outside the sphere ($r \geq a$) , and at a point inside the sphere ($r < a$) . Comment on your answer **[8] Mark**

Examiners: 1- Prof. Dr. Fikry Reicha 2- Prof Dr. Maher Eltonsy
3- Dr. Mohamed Mansour 4-. Dr.Mohamed Kabeel 5-Dr. Hesham Gomaa
6- Dr Abd-Elkareem Abu Elwafa 7- Dr. Nabil Kinawy

Mansoura University
Faculty of science
Chemistry Department
Subject : Chemistry
Course : Organic Chemistry

Second Term .
Predentistry
Date : June 2009
Time Allowed : Three Hours
Full Mark : Twenty Five Marks

ANSWER FIVE QUESTIONS ONLY ; ILLUSTRATE YOURS ANSWERS WITH EQUATIONS . EACH QUESTION FIVE MARKS.

Question One : Show how you could prepare each of the following :

a – Acetone from dichloropropane .
b – Ethanol from ethyl amine .
c - Salicylic acid from phenol .
d - t-Butyl alcohol from acetone .
e –Benzaldehyde from salts of acids .

Question Two : Write the chemical equations and structural formulas of the products obtained from the following :

a – Ozonolysis of methyl propene.
b – Nitration of m- dichlorobenzene.
c - Polymerization of ethylene.
d – Bromination of m- nitrophenol .
e - Reaction of phosphrous pentachloride with benzoic acid .

Question Three : Illustrate with equations each of the following :

a – Different methods used for the preparation of alkyl halides from alcohols .
b - Oxidation of different classes of alcohols .
c - Reaction of different types of aliphatic amines with benzene sulphonyl chloride in presence of sodium hydroxide .

Question Four : Discuss the isomerism and draw the different isomers exists in each of following compounds :

a - Hexane.
b - Aminophenols .
c - sec- Butyl alcohol .
d - Dibromoethylene .
e - Cyclic structure of glucose.

Question Five : Outline the products obtained from the following :

a - Reaction of concentrated sulphuric acid with dimethyl propanol .
b - Addition of HBr to isobutene in presence of hydrogen peroxide .
c - Reaction of sec.propyl bromide with sodium metal .
d - Friedel – Crafts alkylation of p- nitrotoluene .
e - Reaction of methyl ethyl ketone with iodine/ sodium hydroxide .

Question Six : Outline the various synthetic steps for the following transformations :

a - Synthesis of D- mannose from D – fructose.
b- Synthesis of D- glucose from D- arabinose.
c - Synthesis of phenol from aniline .
d- Synthesis of propyne from propane .

WITH BEST WISHES
Prof .Dr. A. M. Khalil

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جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
May 2009

Educational Year: First level **Program (Branch): Chemistry**
Subject: B. (106) **Course(s): Physiology and microbiology**
Time: 2 hrs **Date: 8/6/2009** **Full mark:** 100 **Question mark: 25**

Answer the following questions:

Q1: Complete the following: (15)

1- Cytoplasm is a complex -----system.
2- Osmosis is the movement of ------ from hypotonic solution to hypertonic one across ------- membrane.
3- Enzymes is a ------- that changes the rate of a chemical reaction, but does not affect the nature of the -------.
4- Enzymes act in a ----- range of pH.
5- Photosynthesis is a ----- process, but respiration is a ---- process.
6- Dark reaction in photosynthesis concerned with the fixation of ---------- while, photolysis of -------- is a light or photo-chemical reaction.
7- Aminotransferases catalyze the transfer of ----- group from ----- acid to keto-acid.
8- Permeation of two non-electrolytes with the same solubility in oil depends on --------.
9- Urea solution causes a ------- plasmolysis, while sucrose solution induces a ---- plasmolysis
10- Dialysis is the separation of ------ from ------.

Q2 True /false question: Answer the following questions (T) or false (F) (15)

1- Urease enzyme acts at pH=2
2- Impermeable membrane allows fro both solutes and solvents to pass through it.
3- Movement of water from cell to cell depends on osmotic pressure of cell sap.
4- Osmosis is a simple diffusion.
5- Carbon anhydrase catalyzes the splitting carbonic acid to ammonia and water.
6- All oxygen evolved during photosynthesis comes from CO_2 and water.
7- The reaction, $Fe^{3+} \rightarrow Fe^{2+}$ is an example of reduction.
8- NAD^+ is most likely coenzyme to be involved in the light reaction.
9- Colloids are intermediate state between true solutions and suspensions.
10- Imbibtion of water by seeds starts its germination.

Q3: A- Fill in the blank with the appropriate word or phrase. (Mark for each)

1- ----------, ----------and --------- are the main fruiting bodies in ascomycetes.
2- Main chemical components in virus -------- and -------- so chemically they are described as ---------.
3- Bacteria are classified based on nutrition into ---------- and ----------.
4- The deuteromycota is a heterogeneous group of unrelated species in which ---- ------- has never been observed.
5- Sexual reproduction in phycophyta takes place by ---------, ---------- and Oogamy.

B- True or false (Mark for each)

1- Bacteria can survive unfavourable conditions by producing endospore. ( )
2- Lichens are association between a fungus and photosynthetic portener. ( )
3- Viruses may be present in crystalline form. ( )
4- Storage product in cyanophyta is cyanophcin starch. ( )
5- Bacteriophages are classified into five groups. ( )

C- Choose the most correct answer: (one for each) (Mark for each)

1- Viruses morphologically differ into (a- spheroidal b- elongated c- a and b

d- all)

2- Five kingdoms system for living things classification was proposed by (a- Koch b- Haeckel c- Copeland d- none)

3- Viruses can be cultivated on (a- nutrient agar b- nutrient broth c- chick embryo d- all)

4- Filamentous cyanobacteria contain several types of cell such as (a- apical cell b- separating disc c- vegetative cell d- all)

5- Depending on oxygen requirement bacteria can be (a- aerobic b- anaerobic c- facultative d- all)

Q4: I-With clear labeled diagram and commentary notes describe only TWO of the followings:

a- Lytic cycle for viral replication. (5)

b- General characters of bacteria with special reference to morphology and reproduction. (5)

c- Comparison between life cycle in Rhizopus and Spirogyra. (5)

II- Give a brief account on only one of the following:

d- Economic importance of fungi and algae. (5)

e- Scientific investigation and discovery of microbiology with respect to Pasture; Linnaeus and Whittaker works. (5)

Examiners: Prof. Heshmate Soliman Dr. Adel Elmorsey