المستوى: الاول المادة : تفاضل وتكامل كود المادة: ر 112 الدرجة الكلية:80 درجة	كلية العلوم – قسم الرياضيات برنامج: (جميع برامج المستوى الاول)	دور مايو 2015 الزمن: ساعتان التاريخ : 16 / 5/ 2015

اجب عن الاسئلة الاتية

السؤال الاول: (20 درجة)

(ا)- أوجد مجال تعريف كلا من الدالتين $f(x)=\frac{1}{\sqrt{16-x^2}}$ و $g(x)=x^2+5$ ثم أوجد دالتى التحصيل $(f\circ g)(x)$ و $(g\circ f)(x)$ **(10 درجات)**

(ب)- إحسب النهاية التالية $\lim_{x\to 0}(1+\sin x)^{\cot x}$ **(5 درجات)**

(ج)- أوجد قيمة الثابت c التى تجعل الدالة الآتية متصلة عند $x=0$

$$f(x)=\begin{cases}\frac{1-\cos x}{x^2} & x\neq 0\\ c & x=0\end{cases}$$ **(5 درجات)**

السؤال الثانى : (20 درجة)

أوجد المشتقة الاولى $\frac{dy}{dx}$ للدوال الآتية:

(1)- $y=e^{-2x}\ln(x^3+1)$

(2)- $5x^2y-3y^2+2=0$

(3)- $y=e^{\tan^{-1}(2x^2-1)}$

(4)- $y=\sin^3(3x^2+5)$

السؤال الثالث: (20 درجة)

إحسب التكاملات الآتية:

(ا)- $\int\frac{dx}{\sqrt{12+4x-x^2}}$

(ب)- $\int\frac{1}{x\ln x}dx$

(ج)- $\int\frac{x^2+2x-1}{2x^3+3x^2-2x}dx$

(د)- $\int(\sin x+\cos x)^2\,dx$

السؤال الرابع: (20 درجة)

(ا)- إحسب التكاملات الآتية:

(1) $\int x\tan^{-1}x\,dx$

(2) $\int_{-3}^{1}|x+2|dx$ **(10 درجات)**

(ب)- أوجد مساحة المنطقة المحددة بالمنحنيات الآتية

$y^2=4x,\ y=2x-4$. **(10 درجات)**

مع اطيب التمنيات بالتوفيق والنجاح

اسرة قسم الرياضيات

جامعة المنصورة
كلية العلوم

امتحان : مبادئ المحاسبة والإدارة
كود المادة : ع ١٠٦
الزمن : ٢ ساعات

امتحان / المستوى الأول الفصل الدراسي الثاني
للعام الجامعي ٢٠١٤-٢٠١٥
تاريخ الامتحان الثلاثاء الموافق 19/5/2015

أجب عن الأسئلة التالية :

السؤال الأول : (٥٠ درجة)

أولاً : كلفت خلال العام الدراسى بالاطلاع على الدراسات المعاصرة فى بيئة عصر المعرفة حول حول ثورة النانو تكنولوجى ، وانترنت الأشياء ، وصناعة البرمجيات فى مجال التخصصات العلمية بكلية العلوم .. تناول فى حدود صفحتين فقط لاحد هذه التطورات.

ثانيا : بافتراض أن لدى إحدى المنشآت ثلاث بدائل هي س١ ، س٢ ، س٣ وأن حالات الطبيعة هي: ط١ ، ط٢، ط٣ وأن مصفوفة العائد تتمثل في :

الإستراتيجيات	حالات الطبيعة		
	ط١	ط٢	ط٣
	.٢٥	.٥٠	.٢٥
س١	٨٠	٤٤	-١٤
س٢	١٨	٦٠	٣٢
س٣	-١٤	٢٤	٤٠

والمطلوب :

١- تحديد القيمة المتوقعة لكل إستراتيجية مع بيان أفضل إستراتيجية .
٢- تحديد القيمة المتوقعة للمعلومات الكاملة .
٣- وضح الاستراتيجية المثلى باستخدام المعايير التالية :
التفاؤل ، التشاؤم ، معيار الندم (الأسف).

السؤال الثاني : (٥٠ درجة)

أولاً : ضع علامة (✓) أو علامة (×) أمام كل عبارة من العبارات التالية :

١. يشير التنظيم إلى بيان إلى أين تريد المنظمة أن تصل مستقبلاً ، وكيف يمكنها تحقيق ذلك ؟ والتنظيم يعنى تحديد الأهداف المستقبلية وبيان المهام والأنشطة الواجب القيام بها لاستخدام الموارد والإمكانات المتاحة.
٢. تشير وظيفة الرقابة الى التأكد من عمليات التنفيذ ومدى مسايرتها لما تم التخطيط له.
٣. يمكن تعريف اتخاذ القرار بأنه الاختيار من بين عدة بدائل بقصد تحقيق هدف أو مجموعة من الأهداف.
٤. تتمثل المهارات اللازمة لممارسة العملية الادارية فى المهارات الفكرية والانسانية والفنية.
٥. تعرف الإدارة الالكترونية بأنها العملية الإدارية القائمة على الإمكانات المتميزة للانترنت وشبكات الأعمال في تخطيط وتوجيه والرقابة على الموارد من أجل تحقيق أهداف الشركة.
٦. تتمثل قيمة المعلومة الكاملة في الفرق بين قيمة المعلومة في ظل عدم التأكد وقيمة المعلومة في ظل المخاطرة .
٧. ينتج صافى الربح نتيجة زيادة الايرادات على المصروفات.
٨. يتم الافصاح عن الأصول والالتزامات وحقوق الملكية فى المركز المالى.
٩. تقوم المحاسبة بكل فروعها على وظيفة أساسية هى وظيفتى القياس والافصاح.

اقلب الصفحة

ثانيا : فيما يلى بعض العمليات المتعلقة بمركز الدكتورة لينا عبدة أبو الفتوح الطبى خلال يناير ٢٠١٤ :

١ . فى أول يناير تم بداية النشاط باستثمار ١٠٠٠٠٠ج نقدا وأجهزة ومعدات طبية تبلغ قيمتها ٥٠٠٠٠ج .

٢ . فى ٢ يناير تم سداد مبلغ ١٠٠٠٠ج نقدا مقابل ايجار شهرين مقدم .

٣ . فى ٥ يناير تم شراء أثاث للمركز بمبلغ ١٢٠٠٠ جنيه نقدا.

٤. فى ١٧ يناير بلغ ايراد العمليات الطبية ٤٥٠٠٠ج للسيد / حاتم ابراهيم لم تحصل بعد.

٥ . فى ٢٠ يناير تم سداد رواتب العاملين بالمركز وقدرها ١٤٠٠٠ جنيه نقدا.

٦ . فى ٢٣ يناير تم تحصيل مبلغ ٢٥٠٠٠ج نقدا من المستحق على للسيد / حاتم ابراهيم.

٧ . فى ٢٦ يناير بلغ ايراد الكشف الطبى للمرضى ٦٠٠٠٠ج حصلت نقدا.

٨ . فى ٢٨ يناير تم فتح حساب جارى باسم المركز فى البنك الأهلى بمبلغ ٢٥٠٠٠ج.

٩ . فى ٣١ يناير تم سحب مبلغ ٥٠٠٠ جنيه للمصروفات الشخصية بشيك.

والمطلوب:

١. بيان أثر العمليات السابقة على المعادلة المحاسبية (معادلة الميزانية) .

٢. إعداد قائمة الدخل عن شهر يناير ٢٠١٤.

٣. إعداد قائمة التغير في حقوق الملكية فى ٣١ يناير ٢٠١٤.

٤. قائمة المركز المالي في ٣١ يناير ٢٠١٤.

مع تمنياتي بالتوفيق و النجاح

أ.د. سمير أبو الفتوح صالح

Mansoura University
Faculty of Science
Physics Department
General Physics

Second Term Exam 2014-2015
Physics (102)

Time Allowed: 2 h
Date: 23/ 5 / 2015
All Programs

Total Mark = 60 Mark

Answer the following Questions:

Q.1a) Choose and write the correct answer: (15Marks)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

1) A charge moving in a magnetic field feels a force ……..
a- Perpendicular to both the magnetic field and to the direction of motion of the charge.
b. Perpendicular to the magnetic field and parallel to the direction of motion of the charge.
c. Parallel to both the magnetic field and to the direction of motion of the charge.
d. All are correct.

2) The index of refraction of a substance is the……..
a. Ratio of the speed in light in a vacuum to the speed of light in that substance. –b. Ratio of the speed in light in a substance to the speed of light in that vacuum. –c. Ratio of the speed in light in a substance to the same speed of light in that vacuum - d. None of these is correct

3) Two small conducting spheres attract one another electrostatically. This can occur for a variety of reasons. Which of the following statements MUST be true?
a. At least one sphere is charged. - b. Neither sphere is charged. –c. Both are charged. – d. Both have the same sign of charge. – e. None of these is correct

4) A surface is constructed so that at all points on the surface the electric field, E , points inward. It can be concluded that……..
a. The surface encloses a net positive charge. – b. The surface encloses a net negative charge. – c. The surface encloses no net charge. – d. None of these is correct

5) Consider two isolated spherical conductors each having net charge Q. The spheres have radii a and b, where b > a. Which sphere has the higher potential? (Take the zero of potential to be at ∞.) ……..
a. The sphere of radius a. – b. The sphere of radius b. - c. They have the same potential. – d. More information is needed to answer the question.

6) A positive charged particle traveling with a velocity v in an electric field E~ experiences a force F~ that must be……..
a. Parallel to v. – b. Parallel to E. - c. Perpendicular to v. – d. Parallel to v × E . f. Perpendicular to E .

7) If the net flux through a gaussian surface is *zero*, the following four statements *could not be true*. Which of the statements *must be true*……..?
a. There are no charges inside the surface. – b. The net charge inside the surface is zero. – c. The electric field is zero everywhere on the surface. – d. The number of electric field lines entering the surface equals the number leaving the surface.

8) Electric current may be expressed in which one of the following units?
a. Coulombs/volt . – b. joules/coulomb - c. Coulombs/second - d. Ohms/sec.

9) The force acting between two point charges can be computed using which of the following laws?
a. Ohm's Law - b. Ampere's Law - c. Coulomb's Law – d. Newton's Second Law

10) For an infinite sheet of positive charge, the electric field lines:
a. Run parallel to the sheet of charge. – b. Are perpendicular to the sheet of charge and point in toward the sheet. - c. Are perpendicular to the sheet of charge and point away from the sheet. - d. Fall off as one over r squared.

11) Three capacitors with different capacitances are connected in series. Which of the following statements is TRUE?

a. All three of the capacitors have the same potential difference between their plates. – b. The magnitude of the charge is the same on all of the capacitor plates. – c. The capacitance of the system depends on the voltage applied across the three capacitors.

12) For a parallel-plate capacitor with plate area "A" and plate separation "d", the capacitance is proportional to which of the following?

a. A divided by d squared – b. A times d – c. A divided by d – d. d divided by A.

13) The wave nature of light is demonstrated by which of the following?

a. The photoelectric effect – b. Color – c. The speed of light – d. Diffraction.

14) The force on a charged particle moving parallel to magnetic field lines is:

a. In the direction of the field – b. Zero – c. Perpendicular to the field – d. In the opposite direction of the field.

15) A dielectric material such as paper is placed between the plates of a capacitor. What happens to the capacitance?

a. no change - b. becomes larger - c. becomes smaller - d. becomes infinite

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Q.2a) As light travels from one medium to another with different refractive index, its frequency does not change but its wavelength does, prove that, $n_1\lambda_1 = n_1\lambda_1$ (5 Marks)

Q.2b) What is the difference between the Magnetic and Electric Forces. (5 Marks)

Q.2c) Determine the electric field due to a point charge q by using Gauss's law (5 Marks)

Q3.a) A cubical surface with sides 2.0 m long is oriented with its right and left faces perpendicular to a uniform electric field $E\sim = 1.6 \times 10^5$ N/C. Calculate the net charge enclosed by this surface is approximately. (5Marks)

Q3.b) A singly charged positive ion has a mass of 2.5×10^{-26} kg. After being accelerated through a potential difference of 250 V, the ion enters a magnetic field of 0.5 T, with velocity v = 56,568 m/s, in a direction perpendicular to the field. Calculate the radius of the path of the ion in the field. (5 Marks)

Q3.c) A two farad and a four farad capacitor are connected in series. What single capacitance is "equivalent" to this combination? (4 Marks)

Q4) Write the meaning of each expression. (8 Marks)

i. electric force on the test charge per unit charge.
ii. A pair of equal and opposite charges q separated by a small distance is known as .....
iii. The net electric flux $\Delta\Phi_E$ through any closed surface is equal to the *net* charge q_{in} inside the surface divided by ϵ_o.
iv. The potential energy per unit charge at a point in an electric field.
v. Adjacent points that have the same electric potential.
vi. Is a measure of how much charge must be put on the plates to produce a certain potential difference between them.
vii. Is a vector quantity that is directed along the zero-force axis.
viii. Is the rate at which charge flows through this surface

Examiners: Prof. N. Bakr, Prof. K. Elegaly, Prof. M. T. Ahmed, Dr. N. Kenawy, Dr / M. Abdelhamed, Dr.R . Moustafa, Dr. A. SAran

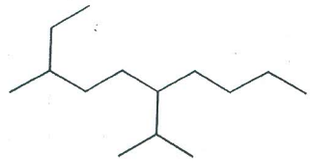
Mansoura University
Faculty of Science
Chemistry Department
Subject: Chemistry
Course(s): Chem.131 Principles of Organic Chemistry 1 for 1st Level Chemistry and Biochemistry students

Second Term
Time Allowed: 2 Hours
Date: May. 2015 (26 – 5- 2015)
Full Marks : 60

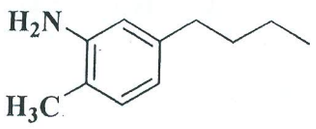
Answer All Questions

Q1 : A – Give the IUPAC name for each compound **(10 Marks)**

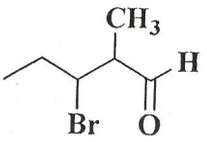
i -



ii -

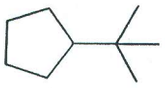


iii -



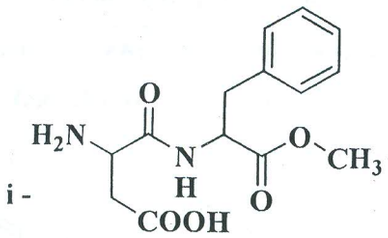
iv -

v -



B - Identify the functional groups in the following molecules **(4 Marks)**

i -



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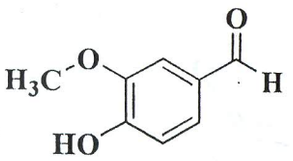
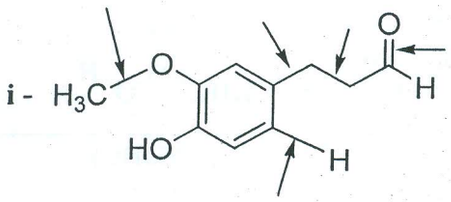
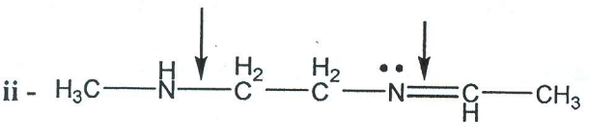


C - In each of the following organic compounds. What orbitals are used to form each indicated bond **(6Marks)**

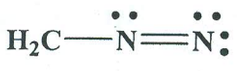
i -



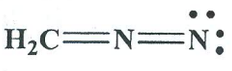
ii -



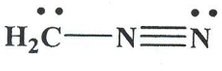
Q2 : A - Consider Lewis formulas **A, B,** and **C**: **(6 Marks)**



A



B



C

(i) Calculate Formal Charge for carbon and nitrogen atoms in each structure **A, B,** and **C**

(ii) Explain why **A, B,** and **C** are resonance structures?

(iii) Which is a more stable structure, **A** or **B** & **B** or **C** ? Why?

B - Draw chemical structure of the following organic compounds **(5 Marks)**

i - 2-phenylbut-2-en-1-ol **ii** -1-chloro-4-propyl-2-vinylbenzene

iii -4-Methylpent-4-en-2-one **iv** -3-methylhex-4-en-1-yne

v -2,6-Dichloro-4-methylcyclohexanol

Please Turn to Next Page

C – For each of the following molecular formula. **(4 Marks)**

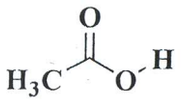
i - C_2H_3N where H are bonded to C atom **ii –** HNO_2

*Draw Lewis structure

* count number of bonding and non bonding electrons

* Count number of σ and π - bonds

D - Rank the following compounds in order of increasing acidity. Explain your answer **(5 Marks)**

$H_3C—O—H$ & $H_3C—NH_2$ & 

Q3: A - Complete the following sentences **(5 Marks)**

i- The IUPAC name of *neo*-pentane is ---------- in which number of 1^0 H atom equal ----------

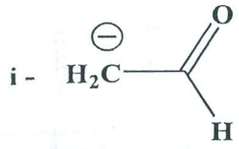
ii – The structural formula of *t*-butyl chloride is ----------while that of *iso*-propyl chloride is ---------

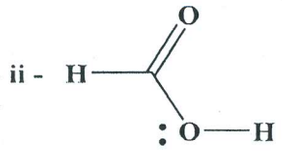
iii- Catalytic reduction of 2-butene give ----------while that of ---------- give 2-methylpropane

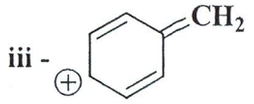
iv – The common name of C_5-carboxylic acid is --------- while its IUPAC name is ----------

v - The structural formula of *neo*-pentyl alcohol is ----------while that of *ter*-pentyl alcohol is ---------

B - Draw all reasonable resonance structures for each species use **curved arrows**. compare the stabilities of these resonance structures indicating major and minor one. **(6 Marks)**

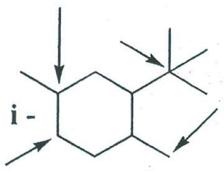
i - 

ii - 

iii - 

C - List the following carboxylic acids in order of decreasing acidity. Explain your answer **(5 Marks)**

D - Classify the designated carbon atoms as 1°, 2°, 3°, or 4° **(4 Marks)**

i - 

ii - $CH_3 - CH_2 - CH(CH_3) - C(CH_3)_3$

Good Luck

Examiners **Prof. Dr. E. B. Moawad**

Dr. Ebrahim Abdel-Galil

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
Second Term: May . 2015

Educational Year: 1st Level **Program : Special Chemistry**
Subject: (N 106) **Courses: Basics of Plant Physiology & Microbiology**
Time: 2 hrs **Date: 2 / 6 / 2015** **Full mark:** 60 **Question mark: 15**

Answer the following questions:

Part I

Q1 I - Put right (√) or wrong (x) for the following statements and correct the wrong : **(10 Marks)**

1- In enzymic reactions , the accumulation of the end products increase the rate of reaction . ( )
2- The true solution contains an electric double layer . ( )
3- The movements of water between plant cells depends on osmotic pressure only . ( )
4- The permeability of non-electrolytes through protein part of plasma membrane . ( )
5- NAD & NADP consider as coenzyme from group carrier ( )
6- The state of Gel converts to Sol by decreasing temperature . ( )
7- Light reactions during photosynthesis consumes oxygen . ( )
8- Amylase enzyme causes hydrolysis of starch . ( )
9- Glycolysis causes breakdown of sugars into mevalonic acid . ( )
10- The hypertonic solution causes increase in cell turgidity. ( )

II- Complete the missing in the following : **(5 Marks)**

1- Fixation of CO_2 into sugars in green tissues occurs through .....
2- Fermintation of sugers under anaerobic conditions produces.....
3- The protoplasm is characterized as a colloidal solution because of the following properities ……,……..&……..
4- Two roles of osmosis in plant life ……&……
5- Factors affecting the rate of respiration ……,……..&…….

Q2 Compare between each two of the following (1- 4) (15 Marks)

1- Competitive and non- competitive inhibitors .
2- Oxidases and peroxidase .
3- Aerobic and anaerobic respiration
4- Effect of temperature on the permeability and enzyme activity.
5- Krebs cycle (Diagram only) .

P.T.O→

Part II

Q3 I: Provide the missing word(s) (10 marks)

1. The binomial nomenclature system gives each organism two names… and…
2. The life cycle where a virus genome replicates without destroying the host cell is called…
3. The genetic material of retroviruses is…
4. Bacteria belong to the kingdom…
5. Bacteria that require oxygen to grow are known as…
6. The cell wall of Archaebacteria lacks…
7. The characteristic component of the cell wall of fungi is …
8. The green alga *Spirogyra* reproduces sexually by…
9. The algal flagellum contains special protein called….
10. Fungal nutrition is totally …

Q3 II: Choose the most correct answer (5 Marks)

1. The bacterial capsule is mostly composed of:
a. protein **b**. phospholipids **c**. polysaccharides **d**. chitin

2. The aquatic flagellated fungi belong to:
a. Ascomycota **b**. Basidiomycota **c**. Chytridiomycota **b**. Zygomycota

3. In algae, vegetative reproduction occurs by:
a. fragmentation **b**. autospores **c**. fission **d**. a+c

4. Which of the following algae is parasitic?
a. *Chlamydomonas* **b**. *Scenedesmus* **c**. *Spirogyra* **d**. *Prototheca*

5. Viruses are:
a. heterotrophs **b**. symbiotic **c**. obligate intracellular parasite **d**. a+b

Q4 I: Mention only **one** main function of viral protein, reverse transcriptase enzyme, bacterial cell wall, bacterial spore, and pilus **(5 Marks)**

Q4 II: Using labeled diagrams only, illustrate lytic viral life cycle and bacterial growth curve **(6 marks)**

Q4 III: Give a brief account of **(4 marks)**

a. algal nutrition

b. viroids and prions

Prof. Dr. Wafaa Shoukry **Prof. Dr. Mohammad Ismail**

الفرقة: الثانيـــــــــــــة الشعب: كيمياء- كيمياء حيوية -كيمياء/ نبات - كيمياء/حيوان-علوم بيئة-جيولوجيا المادة: ر201- رياضيات بحتة	كلية العلوم - قسم الرياضيات	دور مايو2015 الزمن: ساعتـــان التاريخ:2015/6/3

أجب على الأسئلة الآتية:

[1] أ. اوجد الحل العام للمعادلة التفاضلية : $y' = \frac{x-2y+3}{2x-4y+5}$ [10 درجات]

ب. حل مسألة الشرط الإبتدائي : $y'\cos x - y\sin x = \frac{\sin^3 x}{\cos x}$, $y(0)=5$ [10 درجات]

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[2]أ. إذا كانت $z = \tan^{-1}\left(\frac{x^5-y^5}{2x+y}\right)$ ، فاثبت أن : $x\frac{\partial z}{\partial x}+y\frac{\partial z}{\partial y}=2\sin 2z$. [10 درجات]

ب. إذا كانت $S = f(y-z, z-x, x-y)$ ، فاثبت أن : $\frac{\partial S}{\partial x}+\frac{\partial S}{\partial y}+\frac{\partial S}{\partial z}=0$. [10 درجات]

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[3]أ. في إحدى التجارب كان عدد البكتريا في حوض الاختبار عند لحظة معينة هو 500 ، وبعد ساعتين أصبح العدد 2500 ، فإذا كان معدل تزايد عدد البكتريا عند أي لحظة يتناسب مع العدد نفسه ، اوجد :

(ii) عدد البكتريا في حوض الاختبار عند أي لحظة ; [4 درجات]

(ii) عدد البكتريا بعد 6 ساعات ; [4 درجات]

(iii) الزمن اللازم ليتضاعف عدد البكتريا الأصلي . [4 درجات]

[ملحوظة : اعتبر أن $\ln 2 \approx 0.7$ ، $\ln 5 \approx 1.6$ ، $e^{4.8} \approx 121$]

ب. احسب مساحة المنطقة الواقعة في الربع الأول للمستوى والمحصورة بين القطع $y = x^2$ والخطوط $x+y=6$ ، $x=0$. [8 درجات]

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[4] أ. اثبت أن التكامل الخطي: $\int_{(0,2)}^{(1,5)} (x^2+y)dx+(x+2y-1)dy$ هو تكامل محافظ ، ثم احسب قيمته.

[10 درجات]

ب. باستخدام نظرية "جرين" ، حول التكامل الخطي $\int_c (x^2-2y^3)dx+(2x^3+5y)dy$ إلى تكامل ثنائي ، ثم احسب قيمة التكامل الثنائي الناتج . [10 درجات]

مع التمنيات بالتوفيق

Mansoura University Faculty of Science Chemistry Department Subject: General & Inorg. Chemistry Code No. : Chem (121)		Second Term First Level : (Biochem. & Chem.) Program Students Date : 6 June, 2015 Time Allowed: 2 hours Full Mark : 60 Marks

Answer the Following Questions

[Q1] .Complete the following *statements (10 Only):* *(20 marks)*

1. A ray of white light is spread out into ..... , while the line spectrum consists of a .....
2. Principal quantum number (n) measures the ....., ..., whereas (*l*) gives the ....., ... and the magnetic quantum number (m) designates the .....
3. The maximum number of electrons in a shell is ..... whereas the maximum number of orbitals in a subshell is .....
4. The four quantum numbers of the last electron in ($5d^7$) are ....., ..., ..., ...
5. A period is defined as ....., whereas the family is defined as.....
6. The electronic configuration of an element with (Z = 33) is ..... , it is roomed in ..... group and ..... period.
7. The Pauli Exclusion Principle states that..... Consider ($_2$He – atom).
8. All inner transition elements are ..... and ....., their compounds are ..... and .....
9. The electron affinity (E.A) is ..... , while the lattice energy (Lat.E) is .....
10. From Born – Haber cycle for NaCl(s) : (ΔH_f = ... + ... + ... + ... + ...).
11. In the regular octahedron SF_6 molecule all the ....., ..., ...

[Q2]. Put the Mark (√) or (X) on the following statements, then give reason for your answer (7 Only):

1. BF_3 is a linear molecule, whereas $BeCl_2$ is an angular planar. ($_5$B, $_4$Be, $_9$F $_{17}$Cl) (14 marks)
2. In the periodic table, the F element is the most electronegative and Cs is the least. Explain. ($_9$F, $_{55}$Cs)
3. The size of Na atom is smaller than Na^+ ion. ($_{11}$Na)
4. The polarity of the covalent bond increases as follows : C-O> C-N > C-F. ($_6$C, $_7$N, $_8$O, $_9$F)
5. The first ionization energy of P atom is less than that of S atom. ($_{15}$P, $_{16}$S)
6. The isoelectronic species have the same number of protons. Consider $CaCl_2$ compound.
7. The Cl atom does not form a Cl^{2-} ion instead of the Cl^- ion. ($_{17}$Cl)
8. He_2 does not exist, whereas the helium molecule ion (He_2^+) exists under proper conditions. ($_2$He)

[Q3]. Choose and give the reason for your choice for (7 Only) of the following questions: *(14 marks)*

1. The element with electronic configuration [Ne] $3s^2\ 3p^3$ is.....

   a) In the third period b) In the fifth A group

   c) A p-block element d) Phosphorus e) All the above are correct.

2. Which of the following has the largest atomic radius?

   a) Cl b) F c) Br d) I

3. How many equivalent resonance forms can be drawn for CO_3^{2-} ion ? ($_6C$, $_8O$)

a) 1 b) 2 c) 3 d) There are no resonance structures for this ion.

4. Which one of the following is the correct orbital diagram for ground state nitrogen ($_7N$)?

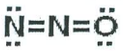
a) 

b) 

c) 

d) 

5. Which of the following Lewis N_2O structures is false?

a)  b)  c)

6. The limiting reagent in a chemical reaction is one that:

a) has the largest molar mass (formula weight). b) has the smallest molar mass (formula weight).

c) has the smallest coefficient. d) is consumed completely.

7. The electron configuration of copper atom ($_{29}Cu$) is given by :

a) [Ar] $4s^1\ 3d^{10}$ b) [Ar]$4s^2\ 3d^9$ c) [Ar] $4s^1\ 3d^9\ 4p^1$ d) [Ar] $4s^2\ 3d^{10}\ 4p^1$

8. Which of the following elements has a positive electron affinity value ?

a) $_{10}Ne$ b) $_9F$ c) $_8O$ d) $_6C$

[Q4]. A. Diagram the Lewis structure, calculate the formal charge and deduce the resonance forms of nitric acid ($HONO_2$). ($_1H$, $_7N$, $_8O$) (4 marks)

B. The composition of adipic acid is (49.3%C , 6.9%H and 43.8%O by mass), and its molecular weight is (146 amu). What are the empirical and molecular formulae ?

(Atomic wts. : H =1 , C =12 , O = 16) (4 marks)

C. Calculate the wave length (λ, nm) and frequency (ν, s^{-1}) of the line in the hydrogen spectrum corresponding to electron transition from (n = 6 to n = 3). Does this line occur in the infrared region?

(Rydberg's constant = 109678 cm^{-1}, speed of light (c) = 3×10^8 m/s, Planck's constant (h) = 6.63×10^{-34} J.s, A = 2.18×10^{-18} J). (4 marks)

Best Wishes

Prof. Dr. T. RAKHA