المستوى الثاني- مجموعة البيولوجي لافقاريات سيلومية حشرات ع ع ع

Mansoura University
Faculty of Science
Zoology Department

20/6/2012

Z 202

Final Exam of Invertebrates and Insects
(For Second Level Biology 2012) (The second Term)

Time: 2 hours
Date: Wednesday 20/6/2012

Answer ALL the following questions

Q1: With labeled drawings only explain each of the following: **(15 Marks)**

A- Digestive system of *Allolobophora*
B- Reproductive system of *Scolopendra*
C- *Artemia*
D- *Lepas* and *Balanus*

Q2 :What do you know about each of the following: **(15 Marks)**

A- Silk-secretion in the spider and the shell and shell structure in Mollusca
B- Morphology of *Cyclops* and scorpion and radula in Mollusca
C- Comparison between *Neptunus* and *Eupagurus*

Q3 : Answer each of the following: **(15 Marks)**

A- Locomotion in the earth worm **OR** in the sand worm
B- With drawings describe the first thoracic and the first abdominal appendages of the prawn giving their modifications and functions.
C- Draw only in detail the capitulum in Acarina.

Q4: Answer as true (✓) or false (X) **(15 Marks)**

1. Pollen brush of food collecting leg is modified from first tarsal segment
2. Halteres are for balance when insects fall in fluids to avoid sinking
3. Stylate antenna subsegments are blade like with a pointed tip resemble scalpel
4. Arthropods are triploblastic coelomate animals with bilateral symmetry
5. No metamerism is a common characteristic between arthropods and insects
6. Antennary socket is the part that carries the antenna
7. Stalked eyes is a distinguishing characteristic of insects
8. Antennae of most female moths are bipectinnate
9. Pretarsus of cockroach and housefly leg has one pad and two claws
10. Hind wing of giant water bug is hemelyteron
11. Clinging legs are all legs of the louse
12. Wings are found on mesothorax and metathorax
13. Scaly wing is the fore-wing of moths and butterflies
14. Tibia of collecting leg is modified to pollen basket
15. Disappearance of 2^{nd} pair of antennae is a distinguishing character of insects

With best wishes
Prof. Dr. Mohamed F.A.Mansour
Dr. Waleed Khaled Elaidy

المستوى الثاني - مجموعة البيولوجي - رياضيات بحتة

الفرقة: الثانيـــــــة الشعب: كيمياء - المادة: رياضيات بحتة	كلية العلوم – قسم الرياضيات	دور مايو ٢٠١٢ الزمن: ساعتـــــــان التاريخ: ٢٠١٢/٦/٢٤

أجب على الأسئلة الآتية: (٢٠ درجة لكل سؤال)

[1] حل المعادلات التفاضلية الآتيـــــــة :

(i) $(x^2+2y^2)dx - xydy = 0$ [10 marks]

(ii) $(e^y + y\cos x)dx + (\sin x - \sin y + xe^y) = 0 \quad , y(0) = 0.$ [10 marks]

[2] أ. حل المعادلة التفاضلية الآتيـــــــة :

$$y' + \frac{y}{x} = \frac{1}{x^3y^4}$$ [10 marks]

ب. إذا كانت الدالة z معطاة بالعلاقة : $z = \ln(x^6 + x^3y^3 + y^6)$ ، فاثبت أن :

$$x\frac{\partial z}{\partial x} + y\frac{\partial z}{\partial y} = 6$$ [10 marks]

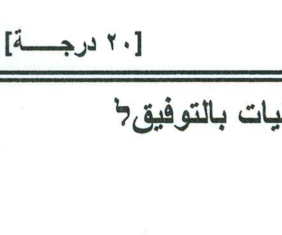
[3] أ. اوجد مساحة المنطقة R في الربع الأول المحصورة بين الدائرتين $x^2+y^2=4$, $x^2+y^2=9$ ، و الخطوط المستقيمة $y=x$ ، $y=0$. [١٠ درجات]

ب. اثبت أن قيمة التكامل : $\int_{(0,0)}^{(1,3)} (4x^3y^2 - 9x^2y)dx + (2x^4y - 3x^3)dy$ لا تعتمد على المسار

الواصل

الواصل بين النقطتين (0,0) ، (1,3) ، ثم احسب قيمته [١٠ درجات]

[4] اذكر نظرية "جرين" .



حقق نظرية "جرين" بحساب كلا الطرفين لمعادلة "جرين" بالنسبة للتكامل :

$$\oint_c (2xy - x^2)dx + (x + y^2)dy$$

حيث c هو المنحنى المغلق للمنطقة المحصورة بالمنحنيات $y = x^2$ ، $x = y^2$

مأخوذاً في الاتجاه عكس عقارب الساعة. [٢٠ درجـــة]

مع التمنيات بالتوفيق

4. The decreasing order of entropy values is:
(a) $C_2H_2 > C_4H_{10} > C_3H_8 > C_2H_4$ (b) $C_2H_{10} > C_3H_8 > C_2H_4 > C_2H_2$
(c) $C_2H_4 > C_3H_8 > C_4H_{10} > C_2H_2$ (d) $C_3H_8 > C_2H_4 > C_4H_{10} > C_2H_2$

5. Which process is accompanied by a decrease in entropy of the materials?
(a) expansion of a gas into a vacuum (b) solution formation
(c) freezing of a liquid (d) thermal equalization between two regions in thermal contact

6. What factor ultimately determines whether any physical process, including a chemical reaction, is spontaneous or not?
(a) the change in entropy of the components involved in the process
(b) the change in entropy of the world outside the process
(c) the change in enthalpy of the universe (d) the change in entropy of the universe

Answer the following Questions: (4 marks for each one)

(1) At what temperature will water boil at a space station where the atmospheric pressure is 490 mm Hg. The latent heat of vaporization of water is 545.5 cal g^{-1}. The normal boiling point of water is 100° C

(2) One mole of ideal gas at 27 °C and 100 bar is allowed to expand reversibly and isothermally to 5 bar. Calculate the amount of heat adsorbed

III- Choose the response that best complete each statement: (2marks for each one)

1. A spontaneous change is one in which the system suffers:
(a) An increase in internal energy (b) A lowering of free energy
(c) A lowering of entropy (d) No energy change

2. In a reaction where entropy decreases, it is found that the reaction has a positive Δ G, but becomes spontaneous as the temperature decreases. Which of the following is true?
(a) Δ S and Δ H are both positive (b) ΔS and Δ H are both negative
(c) ΔS is negative and Δ H is positive (d) ΔS is positive and Δ H is negative

3. The free energy change for a reversible reaction at equilibrium is:
(a) Slightly negative (b) Slightly positive (c) Zero (d) Highly positive

4. Which names are associated with thermodynamics?
(a) Carnot (b) Helmholtz (c) Claussius (d) All

5. Which law of thermodynamics helps in calculating the absolute entropies of various substances at different temperatures?
(a) Zeroth law (b) Ist law (c) II law (d) IIIrd law

6. The equilibrium constant for a chemical reaction will be equal to one (1) under which one of the following conditions?
a) $\Delta H^\circ < 0$ and $\Delta S^\circ = 0$ b) $\Delta H^\circ = 0$ and $\Delta S^\circ = 0$
c) $\Delta H^\circ < 0$ and $\Delta S^\circ > 0$ d) $\Delta H^\circ > 0$ and $\Delta S^\circ < 0$

Answer the following Questions: (4 marks for each one)

(1) Prove the combined First and Second Laws of thermodynamic.

(2) An ideal heat engine is run between two temperatures of 550 K and 275 K. Calculate the Carnot efficiency for this heat engine.

GOOD LUCK, Examiners: Prof. Dr. Awad I. Ahmed.

Mansoura University
Faculty of Science
Chemistry Department
Course: Physical Chemistry
Date : 06/ 06/ 2012

Second term Examination
Subject: Chemistry (241)
Second level
Full Mark : 60 Marks
Time Allowed : 2hours

Answer the Following Questions:

١ - أكتب الاجابة الصحيحة فى ورقة الاجابة ٢ - وضح حل المسائل فى ورقة الاجابة ٣ - الامتحان فى ورقتين

I- Choose the response that best complete each statement: (2marks for each one)

1. The laws of thermodynamics define the properties and behavior of energy. The first law states that energy -----
   (a) equals mass times the speed of light, squared (that is, $E = mc2$)
   (b) can be created by thermonuclear explosions
   (c) cannot be created or destroyed but can be changed from one form into another
   (d) is the basic structure of the universe

2. Which of the following statements is incorrect?
   (a) Heat of reaction at constant volume is represented by ΔU
   (b) Work done by a system is given a negative sign
   (c) Heat of reaction at constant pressure is represented by ΔH
   (d) Endothermic compound are more stable than exothermic reaction

3. Which of the following is a closed system?
   (a) Water being heated in a beaker (b) Reaction of Zn with dil HCI in a test tube
   (c) A sealed bottle containing Br_2 liquid and it vapours (d) A tree in the garden

4. The process carried out in perfect insulation is called:
   (a) Isothermal (b) Isochoric (c) Adiabatic (d) Isobaric

5. The heat absorbed in a reaction at constant temperature and volume is equal to:
   (a) ΔU of the reaction (b) ΔH of the reaction
   (c) - ΔU of the reaction (d) $-\Delta H$ of the reaction

6. For isothermal irreversible expansion of an ideal gas the work done is given by
   (a) $W = nRT \ln P_1/P_2$ (b) $W = -\Delta U$
   (c) $W = nRT (1-P_2/P_1)$ (d) none of these answers

Answer the following Questions: (4 marks for each one)

(1) For the following reaction: $2C_2H_6(g) + 7O_2(g) \rightarrow 4CO_2(g) + 6H_2O(g)$ $\Delta H° = -2856$ kJ $\Delta G° = -2884$ kJ
   a- Determine the $\Delta S°$ of the system (i.e. the reaction) at 25° C in J/K
   b- The ΔS of the surroundings in J/K, at 25° C, is:

(2) The equilibrium constants for the reaction $N_2(g) + O_2(g) \longrightarrow 2\ NO(g)$ at 1727°C and 2027°C are 4.08×10^{-4} and 1.69×10^{-3} respectively. Calculate ΔH for the reaction in kJ.

II- Choose the response that best complete each statement: (2marks for each one)

1. For adiabatic expansion of an ideal gas the relation between volume and pressure is given by A.
   (a) V/T = constant (b) VT = constant (c) PV^{γ} = constant (d) $[T/V]^{\gamma-1}$ = constant

2. The freezing of liquid water to form ice
   (a) results in uptake of heat from the surroundings
   (b) results in release of heat to the surroundings
   (c) results in no transfer of heat to or from the surroundings
   (d) whether heat is taken up or given off during freezing depends on the temperature

3. Which of the following statements best describes the spontaneity of a reaction at 25°C for which S_{sys} is negative and S_{surr} is positive .?
   (a) The reaction cannot be spontaneous at 25°C.
   (b) The reaction will be spontaneous at all temperatures.
   (c) The reaction will be spontaneous only if S_{sys} is greater in magnitude than S_{surr}.
   (d) The reaction will be spontaneous only if S_{surr} is greater in magnitude than S_{sys}.

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Chemistry** **Course(s):** Organic Chem. 236	كلية العلوم جامعة المنصورة	**Second Term** **2nd level Students** **Time Allowed: 2 hours** **Full Mark: 80 Marks** **Date:** June 2012

Answer All Questions

1.a) Predict the products : **[21 Marks]**

i) $(CH_3)_2C=O + NH_3 \rightarrow \ldots\ldots \xrightarrow[Pt]{H_2} \ldots\ldots$

iii) $CH_3\text{-}C(=O)\text{-}NH_2 \xrightarrow{Br_2 / NaOH} \ldots\ldots$

iii) $(CH_3)_3N$ — $\xrightarrow{PhSO_2Cl} \ldots\ldots$; $\xrightarrow{CH_3Br} \ldots\ldots$

iv) $(CH_3)(CH_3CH_2)NH \xrightarrow{HNO_2} \ldots\ldots$

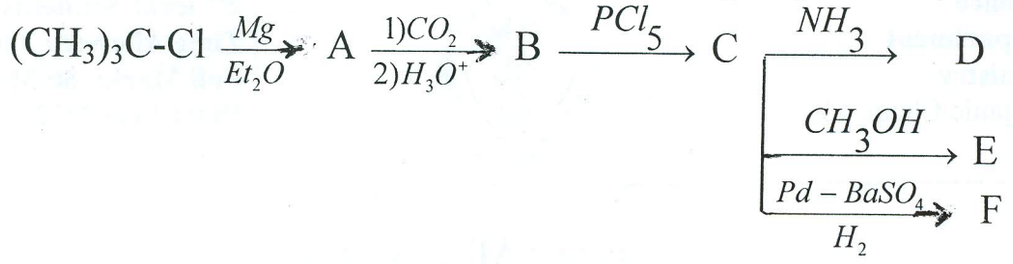
v) $(CH_3CO)_2O \xrightarrow{NH_3} \ldots\ldots$

vi) $CH_3COO\,C_2H_5 \xrightarrow{NaOEt} \ldots\ldots$

b) List the following radicals in order of their stability : **[6 Marks]**

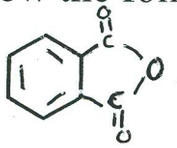
$(CH_3)_2\dot{C}H$, $\dot{C}H_2$, $\dot{C}H_3$, $CH_3CH_2\text{-}\dot{C}H(CH_3)$, $CH_2\text{-}\dot{C}H\text{-}CH_2$, $CH_3\text{-}CH_2\text{-}\dot{C}(CH_3)_2$

2.a) What are compounds A to F in the following sequence : **[18 Marks]**



b) On chlorination of n-butane, it was found that reactivity ratio between 1° : 2°: H atoms is 1 : 2.5 . Calculate the percentage of each isomer **[9 Marks]**

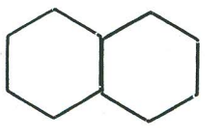
3.a) Show how the following conversions could be affected : **[9 Marks]**

i)  → $CH_3CH_2NH_2$

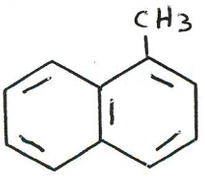
ii) $CH_3CONH_2 \rightarrow (CH_3)_3N$

iii) $CH_3COOH \rightarrow CH_3COCH_2COOEt$

b) Show the effect of NBS/ hγ on these compounds : **[8 Marks]**







c) Deduce the structures of the following compounds that give only monochlorination product : **[9 Marks]**

$C_6H_{12}, C_5H_{12}, C_8H_{18}$

Best Wishes; Prof. Dr. Ez Kandil, Dr. M. Yosef

المستوى الثاني - مجموعة البيولوجي - ميكروبيولوجيا عامة (ن ٢٠٤)

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany

Educational Year: Second Level | **Second Term: May 2012** | **Subject: Botany** | **Code: B 204**

Course: General Microbiology

Division: Microbiology, Chemistry and Botany, Chemistry and Zoology, and Environmental Sciences

Time: 2 hours | **Date: 3/6/2012** | **Full Mark: 60** | **Question Mark: 20**

Answer the following questions:

Q1: (A) Complete the missing parts: **(15mark)**

1- The chemical substances produced by microorganisms that inhibit or kill the growth of other microorganisms are known as....................

2- Microbiology is the branch of science that studies..................

3-In microbial culturing, sterile techniques are used to prevent....................

4-................ is an increase in the size of a given population of unicellular microorganisms such as bacteria and yeasts.

5- A microbe growing in the refrigerator is termed as....................

6- Organic compounds can be formed from carbon dioxide and light by................ only.

7- .... was the first person who extensively described microorganisms.

8-Microorganisms preferring to live in high hydrostatic pressure environments are known as.................

9-.................. is one of the sterilization methods that removes microorganisms rather than killing them.

10- Chemical substance that can be added to microbiological nutrient media and changing their physical properties is called..................

(B) Give a brief account of each of the following: **(5 mark)**

1- **Bacterial endospores.**
2- **Pasteurization.**

Q2: Choose the correct answer: **(20mark)**

1-Which (if any) of the following is most reliable for determining the number of viable bacteria per mL?

a. Turbidity measurement
b. Direct microscopic count
c. Weighing the bacteria
d. None of the above

2- Bacteriostatic means:

a. bacterial growth is inhibited
b. bacterial death
c. bacterial static charges
d. a metabolite produced by bacteria

3-Fungi are:

a. Heterotrophs
b. Chemoautotrophs
c. Photoautotrophs
d. Only parasites

4- In aquatic environments the production of oxygen is largely attributed to:

a. Bacterial activity
b. Fungal activity
c. Microalgae activity
d. All

5-Degradation of toxicants by microorganisms is a biological phenomenon known as:

a. Fermentation
b. Decomposition
c. Bioremediation
d. None (Define)

6-The optimum growth temperature of a thermophile is around:

a. 10°C
b. 30°C
c. 60°C
d. 90°C

7-Bacteria growing in batch culture may enter decline phase as a result of:

a. Crowding
b. Accumulation of toxic products
c. Depletion of nutrients
d. All of these

8-During bacterial growth, sporulation occurs in:

a. Lag phase
b. Stationary phase
c. Log phase
d. Decline phase

9-The microorganisms useful for fermentation processes are:

a. Bacteria
b. Yeasts
c. Fungi
d. None of these

10-This is an agar plate method and is commonly used for estimation of the number of bacteria in milk:

a. Standard Plate Count (SPC)
b. Spread plate
c. Lawn culture
d. Roll tube method

Q3: A- Compare between each of the following: **(5 mark)**

1- Disinfectants and antiseptics.

2- Acidophiles and alkaliphiles.

B- With the help of a labeled diagram, describe briefly the different phases of microbial growth. **(5 mark)**

C- Define: **(10mark)**

1-Biofilm **2-Glycocalyx** **3-Synthetic media**

4-Obligate anaerobes **5-Binary fission**

Examiners: **Dr. Mohamed Ismail** **Dr. Ghada Samir** **Dr. Ahmed El-Shobaky**

المستوى الثاني - مجموعة البيولوجي الوراثة الخلوية وفسيولوجيا النمو والتطور ٢٠١٢

Mansoura University
Faculty of Science
Botany Department

جامعة المنصورة
كلية العلوم
قسم النبات

Final Examination in Botany
May 2012

Educational Year: Second Level Program (Branch): Biology
Subject :Bot (203) Course(s): Cytogenetic&physiology of growth and Development

Time: 2 hrs Date: 13 / 6 /2012 Full mark: 60 Question mark: 20

Answer the following questions:

Q.1 A- Write short notes on the following: **(10 marks)**

1- Types of chromosomes.
2- Pseudo-Dominance.
3- Bar-eye in Drosophila.

B- Explain briefly: **(10 marks)**

1- Cell-cycle.
2- Lampbrush chromosomes.
3- Types of replication of DNA (Explain only the common type).

Q.2 A- Fill in the spaces using suitable words or phrases: **(5 marks)**

1- Function of chromosomes of eukaryotes are involved in two main activities .....and.....
2- Chromosomes line up along the equatorial plate during the.....stage of mitosis.
3-Salivary gland chromosomes attain its huge diameter through the process of .....
4- The ..... represents specific proteins that bind to centromeric DNA and is the site of spindle fiber attachment.
5- The number of chiasmata per bivalent depends on .....and.....

B- Choose the correct answers: **(5 marks)**

1-The three forms of DNA?
a- A, B, Z forms b- A,B,C forms c- B,C, Z forms
2- Cells with three chromosomes complement?
a- Triploid b- Trisomic c- Monosomic
3- Which of the following base is never found in RNA?
a- Cytosine b- Uracile c- Thymine
4- Which statement describes the base pairing in nucleic acids?
a- Purine bases always pair with other purine bases
b- Purine bases can only pair with pyrimidine bases
c- Adenine can not pair with either uracil or thymine
5- How many nuclear divisions occur during Meiosis?
a- one b- two c- zero

بقية الأمتحان انظر خلف الورقة

C - Comment on the following items (5 marks, each one mark)

1- The vegetative stem primordia is changed to floral primordia.
2- Some seeds have physical dormancy and some have mechanical dormancy
3- Some plants are chill-resistant.
4- Secondary metabolites are produced by some plants.
5- Some plants have hypogeal germination.

D - Complete the following sentences (5 marks, each ½ mark)

1- Dormant seed is....., however quiescent seed is.....
2- Fruit development can generally be considered to occur in four phases.; the first three are 1-....., 2-....., 3- .....
3- .....require a certain minimum length of daylight to initiate flowering, so these plants flower in the spring or summer.
4- Desiccation postponers are able to ..... under drought conditions. Among them are ..... that are using water carefully and.....; that are usually deeply rooted and spend water aggressively. As well as..... can grow under dehydration condition.

Q.3 Explain briefly each of the following (20 marks, each 4 marks)

1- ABC model of flowering
2- Combined dormancy
3- Heat chock proteins
4- Drought resistance mechanism
5- Fruit ripening

Examiners: Prof. Samia Haroun Prof. Magda Soliman
Dr. Amr Mowafy Dr. Rehab Rizk