Mansoura University
Faculty of Science
Zoology Department

May 2015
Second year- Biology
Subject: Invertebrates&Entomology
Date: 17 May 2015
Time Allowed: 2hr

Answer the following questions with labeled diagrams if possible

Question 1 : (20 Marks)

A- With labeled drawings , give an idea on the stomodaeum of the annelids you been studied and the prawn.

B- Illustrate the skeleton of cirripeds, carapace of *Neptunus* and the reproduction in *Daphnia*.

C- What do you know about the locomotion in *Nereis* and fourth thoracic and first abdominal appendages in *Penaeus* .

Question Two: Answer **Four** only of the following: (20 Marks)

a-Compare between Chilopoda and Diplopoda.
b-Write briefly on the general characters of chelicerata.
c-Mention the economic importance of Echinodermata and mollusca.
d-Compare between Dibranchiata and Tetrabranchiata.
e-Mark ( ) or ( ) on each of the following:
1- In bivalves, radula is present.
2- Echinodermata has bilateral symmetry.
3- Taxonomy of Mollusca is based on the shell
4- Segmentation is obvious in ticks and mites.
5- Excretion in Uniramia occurs by one pair of coxal glands.

Question 3 : (20 Marks)

A- Briefly write short notes on :
1-The general characters of insects **2-** Springing apparatus and how it works ?
3- Wing coupling.

B- MCQ :

1. …….. important for insect classification.
a) Legs b) Antennae c) Wings d) Mouth parts
2- ……. retractile, tubular & developed from thye two galeae by its elongation and rolling into a semi-tube within inter-locked hooks.
a) Proboscis of butter flies b) Proboscus of house flies c) Proboscis of honey bee workers d) Labium of mosquitoes .
3- We can differentiate between Culex and Anopheles via the shape of ……..
a) antennae b) mandibles c) labium d) maxillary palp
4- Lepidoptera is a class of insects that have a ……. Wing type.
a) scaly b) membranous c) elytra d) tegmina
5- …….. is a modified ovipositor for defense and attack.
a) Springing apparatus b) Cerci c) Stinging apparatus d) Prolegs

Wih best wishes

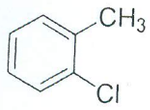
Prof. Dr. Mohamed Fathy Abdel-Aal Mansour **Prof. Dr. Ahmed Ebeid**
Dr. Sherif Ramadan **Dr. Zainab Shaaban**

Mansoura University
Faculty of Science
Chemistry Department
Subject: Organic Chemistry
Course(s): Chem.236

Second Term
Time Allowed: 2 Hours
Date: 20 / 5 / 2015
Full Marks: 80
2nd Level

Answer All Questions

[Q1] A) Read carefully the compounds (1)-(5), then answer the questions: (12 Marks)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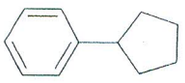
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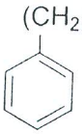
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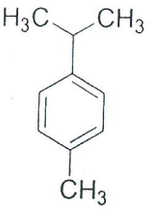
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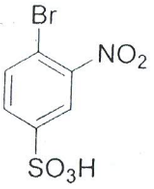

(5)

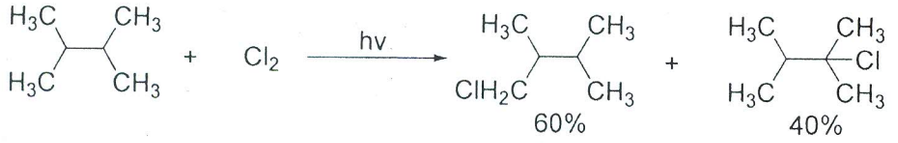
i) The nitration product of (1) is ..... and the reaction of (2) with NBS/ hυ gives.....

ii) Diagram the synthesis of (2) and (3)

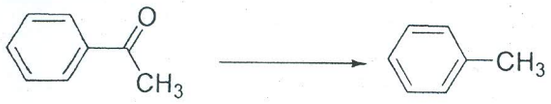
iii) Show the products of the reaction of (4) with each of NClS/hυ and $Cl_2/FeCl_3$

iv) Account for the synthesis of (5) starting with benzene

B) Calculate the reactivity ratio between 1° and 3° H-atoms in this reaction: (6 Marks)



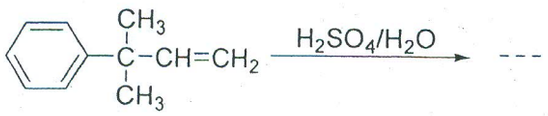
C) Diagram these conversions: (9 Marks)

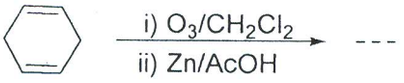
i) 

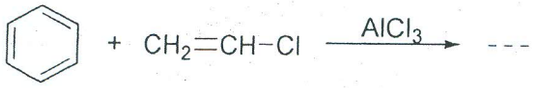
ii) $CH{\equiv}CH \longrightarrow H_3C-C{\equiv}C-CH(CH_3)_2$

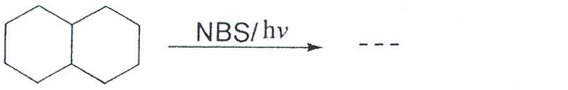
iii) $H_3C-C{\equiv}CH \longrightarrow H_3C-CH(OH)-CH_2(OH)$

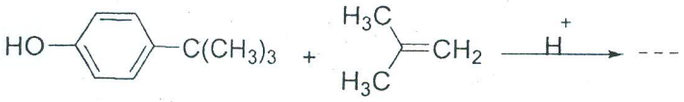
[Q2] A) Predict the products: (20 Marks)

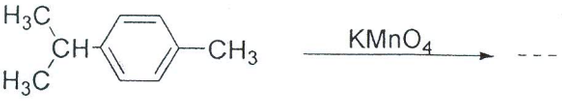
i) 

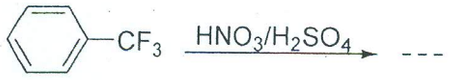
ii) 

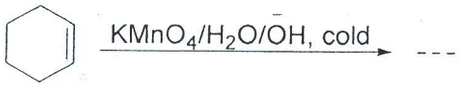
iii) 

iv) 

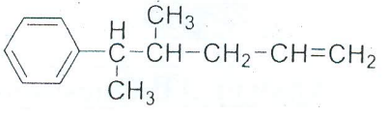
v) 

vi) 

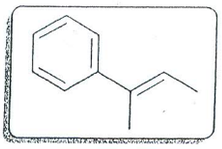
vii) 

viii) 

B) Show the reactive centers of chlorination ($Cl_2/h\upsilon$) in the compound below and arrange them in decreasing reactivity: (7 Marks)



[Q3] A) Predict the favored product(s) of the reactions of 2-phenyl-2-butene with each of:(18 Marks)



i- O_3/CH_2Cl_2; Zn/AcOH **ii-** Br_2/H_2O **iii-** NBS/hυ

iv- HCl/H_2O_2 **v-** H_2SO_4/H_2O **vi-** $KMnO_4/H_2O/^-OH$, cold

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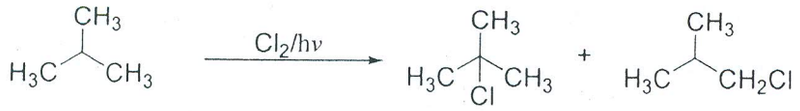
B) It was found that the reactivity ratio between 1° and 3° H-atoms in chlorination of 2-methylpropane 1:4.5 Calculate the percentage of each isomer? (6 Marks)



C) Show structure and name of the product of the reaction of cyclopentene with $KOC(CH_3)_3/CHCl_3$. (2 Marks).

With our Best Wishes

Prof. Dr. Ez Kandil **Dr. M. Yosef** **Dr. M. El fedawy** **Dr. N. Shaker**

Mansoura University
Faculty of Science
Zoology Department

Subject: Functional Morphology (Z 203)
Date: 24/5/2015
Time : 2 hours

Final examination for 2nd level students, programs
Chemistry/Zoology&Chemistry/Botany&Microbiology&Environmental Sciences

First question: **[20 mark]**

A- Write a short notice on each of the following: **[15 mark]**

1. Conversion of glucose into glyceraldehydes-3-phosphate.
2. Role of pancreatic juice in digestion of proteins and carbohydrates.
3. The heart valves.

B- Correct the following sentences _ mention the reason if any: **[5 marks]**

1. Citric acid cycle is a specific metabolic pathway for carbohydrates metabolism and can occur in the absence of oxygen.
2. Transamination is an irreversible reaction which occurs in two steps and leads finally to release of both ammonia and energy.
3. Pepsin is secreted by intestinal mucosal cells and catalyzes the conversion of proteins into amino acids.
4. The electrical signal of conduction system of the heart begins in atrioventricular node, which located between the right atrium and right ventricle.
5. Heart sounds result from the diastole and systole of the heart.

Second question: **[20 mark]**

A- Write on the following items:

1. Synaptic transmission. **[5 marks]**
2. Abnormalities in growth hormone secretion. **[5 marks]**
3. Structure and function of myosin and actin filaments. **[5 marks]**
4. Hormones secreted from pancreas. **[5 marks]**

Third question: **[20 mark]**

A. Define each of the following: **[8 marks]**

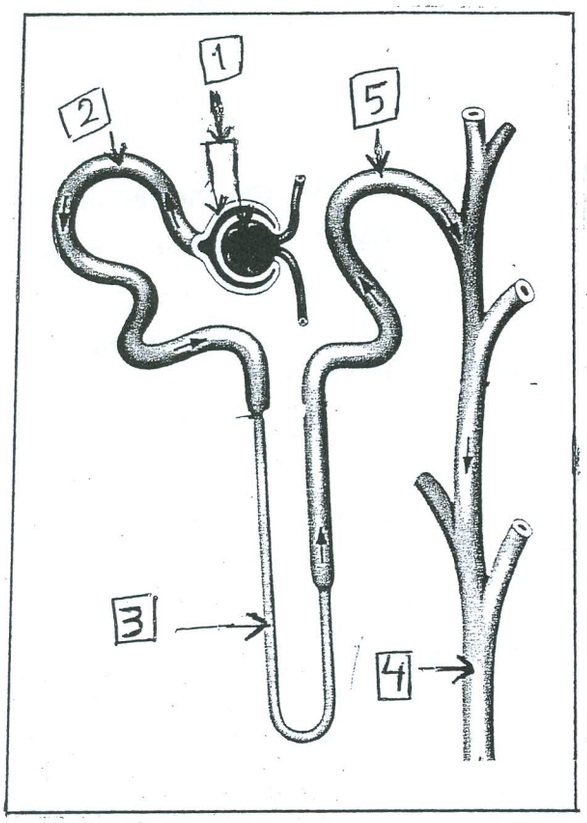
1. Boyl's law.
2. Inspiratory capacity.
3. Homeostasis.
4. Residual volume.

B. Compare between: **[4 marks]**

1. ADH & Aldosterone.
2. Peripheral & Central mechanisms of breathing.

C. What do you know about Juxta – Glomerular apparatus? **[3 marks]**

D. Label the following diagram of the nephron and mention the role of it in the formation of urine. **[5 marks]**



مع التمنيات بالنجاح

Dr./ Faried Abdel-kader Dr./ Hanaa Serag Dr./Magda El-Komy

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
Second semester: May. 2015
Educational Year: Second level Program: All Biology Programs
Code: B 203 Courses: Cytogenetics & Physiology of Plant Growth and Development
Time: 2 hours Date: 27/5 /2015 Full mark: 60 marks

Answer the following questions:

Part I : Cytogenetics

I A- Compare between lampbrush and polytene chromosomes. (5 marks)

B- Complete the following with a suitable word or phrase. (5 marks)

1. In zygotene,homologous chromosomes pair together to form the ……. and the process of pairing is known as …….
2. The stability of DNA molecule is due to……and …….
3. The double helix of A form makes a turn every ……..whereas B form makes a turn every…….
4. The differences between DNA and RNA are…… and……
5. The centromere contains two protein structure, each known as ……which functions in ……..

II Fill in the spaces using suitable words or phrases: (10 marks)

1- Any organism with more than two genomes is called.....
2- Raphanobrassica is a classical example of.....
3- ..... organisms have two sets of chromosomes or genomes in the nuclei of their body cells.
4- .....is a term used to describe a cell with four chromosome complement.
5- .....individual forms gametes of two types (n) and (n-1).
6- There are two main kinds of polyploids.....and....., may be distinguished on the basis of.....
7- Any organism which has lost a chromosome pair .....and genomic formula.....
8- There are two main categories of chromosomal abnormalities that result in changes in chromosome number .....and.....
9- Diploids which have one extra chromosome are called.....and the chromosomal formula.....
10- Diploid organisms which are missing one chromosome of a single pair are .....with genomic formula.....

III Formation of loop is a cytological effect of structural chromosomal abnormalities (deletion, duplication and inversion) on meiosis. (Compare) (10 marks)

Part II: Physiology of growth and development

I **Write what you have studied about: (10 marks)**

1. ABC model of flowering.
2. Types of growth based on direction.
3. Concept of totipotency.
4. Factors affecting vegetative growth.
5. Vernalization.

II A- Mention the types of monocot seeds with modified embryo structure or position with giving an example to each type. (3 marks)

B- Write the main events in each of the following phases: (4 marks; 2 marks each)

1. Maturation and drying phase of seed development.
2. Plateau phase of water imbibition.

C- Differentiate between epigeal and hypogeal germination [position of cotyledons – embryonic stem elongation- type of seeds which it occur in] (3 marks)

III **Complete the following sentences (10 marks; 0.5 mark each)**

a. In germination of dicot seeds the apical bud formed a …(1)… by the action of …(2)…

b. …(3)… are responsible for the formation of adventitious roots while …(4)… is responsible for the formation of adventitious shoots.

c. …(5) …, …(6)… and …(7)… are examples of auxins, gibberellins and cytokinins, respectively.

d. Seeds with undeveloped embryo and doesn't subjected to enough light conditions are called …(8)… dormant seeds.

e. Scarification can break …(9)…, …(10)… and …(11)… which are …(12)…

f. …(13)… and …(14)… can control apical dominance of the plant.

g. Chemical dormancy can be overcome by using two strategies of breaking dormancy which are …(15)… and …(16)…

h. …(17)… dormancy can be caused by conditions inside and/or outside the embryo.

i. …(18)… is a chemically inhibiting compound.

j. …(19)… and …(20)… are types of plant growth inhibitors.

With our best wishes

Examiners:

Dr.Linda Z. Samaan Dr. Rehab M. Rizk Dr. Ashraf A. Elsayed

Dr. Amany M. Kazamel Dr. Bardees M. Mickky

Mansoura University
Faculty of Science
Chemistry Department
Subject: Thermodynamics
Course code: Chem241

Level: Second level
Major: Chemistry (General)
Time allowed: 2 hours
Full Mark: 60 Marks
Date: May 31, 2015

I- Choose the response that best fits each statement [20 Marks]

1. An adiabatic expansion of a gas is one in which
a) The pressure is kept constant
b) The volume is kept constant
c) The temperature is kept constant
d) The system neither loses nor gains heat

2. What is the name of a process in which pressure remains constant?
a) Adiabatic b) Isobaric c) Isochoric d) Isothermal

3. In a cyclic process,
a) The total change in temperature of the system must be positive
b) The total change in internal energy of the system must be negative
c) The total change in internal energy of the system must be zero

4. Specific heat of a substance measures
a) The amount of energy required to raise the temperature of a substance one degree
b) The amount of heat required to reach the boiling point
c) The total thermal energy in a substance
d) The amount of energy required to raise the temperature of one gram of a substance one degree

5. Which process is accompanied by a decrease in entropy of the materials?
a) Expansion of a gas into vacuum
b) Dissolution of solid particles in a liquid
c) Precipitation of crystals form solution
d) Vaporization of a liquid

6. The condensation of any gas to a liquid is expected to have
a) Positive ΔH and positive ΔS
b) Positive ΔH and negative ΔS
c) Negative ΔH and negative ΔS
d) Negative ΔH and positive ΔS

7. The entropy of the universe
a) Is zero
b) Remains constant
c) Is always increasing
d) Is also decreasing

8. A reaction with a $\Delta G^{\circ} = -30\ kJ/mol$ at 25°C,
a) Has a $K = 0$
b) Has a positive K but $K < 1$
c) Has a negative K
d) Has a $K > 1$

9. According to the first law of thermodynamics, the total amount of energy in the universe is
a) Always increasing
b) Always decreasing
c) Varying up and down
d) Constant

10. Which of the following is true for the reaction, $H_2O\ (l) \leftrightarrow H_2O\ (g)$ at 100 °C and 1 atm?
a) $\Delta H = 0$ b) $\Delta S = 0$ c) $\Delta H = \Delta U$ d) $\Delta H = T\Delta S$

11. Which of the following is true about isothermal free expansion of a gas?
a) $\Delta U = 0$ b) $\Delta T = 0$ c) $P_{ext}\, dV = 0$ d) All

12. Which of the following reactions is spontaneous at relatively low temperatures?
a) $NH_4Br\ (s) + 188\ kJ \rightarrow NH_3\ (g) + Br_2\ (l)$
b) $NH_3\ (g) + HCl\ (g) \rightarrow NH_4Cl\ (s) + 176\ kJ$
c) $2\ H_2O_2\ (l) \rightarrow 2\ H_2O\ (l) + O_2\ (g) + 196\ kJ$

13. For an irreversible (spontaneous) process at constant pressure and temperature, the free energy change is
a) Positive b) Negative c) Zero d) Impossible to tell

14. The primary function of any heat engine is to
a) Convert work into heat
b) Create energy
c) Convert heat into work
d) Destroy energy

15. The following reaction is endothermic $3O_2\ (g) \rightarrow 2\ O_3\ (g)$, then the reaction is
a) Spontaneous at all temperatures
b) Non-spontaneous at all temperatures
c) Spontaneous at low temperatures
d) Spontaneous at high temperatures

16. All processes occurring in nature are
a) Reversible b) Irreversible c) Ideal d) Isothermal

17. An ideal gas is compressed adiabatically, the temperature will
a) Increase b) Decrease c) Stay the same d) Can't tell

18. Heat absorbed by the system at constant pressure equals to
a) ΔU b) ΔS c) ΔH d) w

19. Which of the following properties is NOT an extensive property of the system?
a) Volume b) Mass c) Internal energy d) Density

20. The internal energy of an ideal gas is dependent on
a) Temperature and pressure
b) Temperature and volume
c) Only Temperature
d) Only volume

II- Derive only three of the following: [18 Marks]

1. Vant Hoff's isotherm and isochore
2. Clausius-Clapeyron equation
3. The formulation of the third law of thermodynamics showing how standard entropy can be determined from it.
4. The relation $\Delta G_{sys} = -T\ \Delta S_{univ}$
5. The relation between C_P and C_V for an ideal gas

III- Answer the following questions: [22 Marks]

1. A perfect monoatomic gas ($C_P = \frac{5}{2}R$) is allowed to expand adiabatically from 25.0 L at 1.0 atm and 0 °C to a volume of 50.0 L. Calculate the final pressure and temperature. How much work is done?

2. Given the following standard molar entropies, calculate ΔS° of the reaction at 298 K

	$4NH_3\ (g)$	+	$3O_2(g)$	→	$2N_2(g)$	+	$6\ H_2O\ (l)$
$S^\circ_{m,298}\ J/mol\ K$	192.45		205.138		191.61		69.91

3. Three moles of an ideal gas is expanded isothermally and irreversibly against a constant external pressure of 1.0 atm from 2.0 L to 10.0 L at a temperature of 20.0 °C. Calculate w, q and ΔS_{univ}.

4. A Carnot-cycle heat engine operates between 800 and 0 °C. What is the maximum efficiency of the engine? If q_H is 1000 J, find w and q_C.

(Ideal gas constant: $R = 8.314\ Jmol^{-1}K^{-1}$)

Best wishes

Prof. Dr. Abd Al-Aziz Fouda Prof. Dr. Awad Ibrahim

Dr. Hany El-Shinawi

Mansoura University
Faculty of Science
Botany Department
Mansoura - Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة- مصر

Final examination in Botany
Second Term May 2015

Educational Year: Second level **Subject:** B (204) **Course:** General Microbiology
Programs (Branches): Microbiology - Chemistry / Botany – Environmental Science -Chemistry / Zoology
Time: 2hrs. **Date:** 7/6/2015 **Full mark:** 60 **Question mark:** 20

Answer the following questions (الامتحان في صفحتين)

Q1): A): **Complete the following sentences :-** (6 Marks)

1. Theory that life just developed from non-living matter is …… ……
2. Alexander Fleming discovered …… as a natural antibiotic.
3. ….. pressure needed to prevent water from flowing across a selectively permeable.
4. ……. is using of microbes to clean up pollutants and toxic wastes.
5. ……. are the basic units of structure and function in living things.
6. Phagocytosis defined as a …….. extend and engulf particles .

B): **Write short notes on :-**

1. Koch's postulates (4 marks)
2. Characteristics of living systems (6 marks)

C): **Simply compare between each of the following :-**

1. Bacteria and viruses (2 marks)
2. Mitochondria and chloroplast (2 marks)

Q2): A): **Chose the most correct answer :-** (3 Marks, you have one free)

1- ----------is a statistical estimation of the number of organisms present in a sample.
a) MPN b) Metabolic Activity c) Serial Dilutions d) all

2- The media which favor the growth of some microorganisms and inhibit others called------.
a) enriched b) differential c) selective d) none

3- The range of temperatures for the microbial growth can be defined by-------- cardinal thermal points.
a) two b) three c) four d) five

4- Sulfur is one of macronutrients which usually supplied as ----------.
a) organic b) sulfide c) elemental sulfur d) sulphate

B): **True and false (circulate the correct response); correct simply the wrong one:-** (3 Marks, you have one free)

1- (T – F) Bacterial division occurs according to a semi-logarithmic progression.
2- (T – F) "Facultative" means that the organism can grow under the condition and require it.
3- (T – F) Cotransport system is active uptake of nutrients using both antiport and symport.
4- (T – F) Vitamins are the only substances required by microbes as growth factors.

فضلاً اقلب الصفحة

C): **Fill the gaps in the following sentences:- (3 Marks, you have one free)**

1- To avoid damage by toxic oxygen, bacteria must have ---------- and either catalase or -------.
2- Siderophores are ---------- that secreted by bacteria to bind to----------.
3- A ----------is an open system in which fresh media is continuously added to the culture at a constant rate, and old broth is removed at the same rate using device called a----------.
4- Pure culture means population of cells arising from ----------.

D): Describe ONLY ONE of the following:- (5 Marks)

- Classification of organisms based on oxygen requirements
- Reproduction in microbes using binary fission.

E): Concisely explain ONLY ONE of the following:- (6 Marks)

- Bacterial growth curve typically, a batch culture passes through four distinct stages
- Nutritional types of microorganisms based on energy, electron and carbon sources

Q3):

A- **Answer ONLY TWO of the following:- (10 marks):**

1- Discuss in detail the factors affecting the effectiveness of antimicrobial agents including (environmental influences and the number of microbes).
2- Antibiotics and their mode of actions (Give examples).
3- Osmotic pressure is one of the physical sterilization methods. Explain.

B- **Complete the following sentences:- (5 marks)**

1- Dry heat sterilization is of two types…..…… and…….. , both types are used in sterilization of……..…..and……respectively.
2- Non-ionizing radiation includes……which is used for sterilization of……..…..by affecting the genetic material through the formation of……
3- ……..is used to sterilize heat-sensitive materials such as……..……
4- Milk pasteurization uses temperatures about …….. for…….. , this process is known as……
5- Thermal death point (TDP) is defined as……..

C- **Correct the underlined parts:- (5 marks)**

1- Microbial death is commonly defined as loss of the movement of the cell.
2- The principal effect of ionizing radiation on microbes is the formation of secondary metabolites.
3- Moist heat kills microorganisms by preventing mRNA transcription.
4- Burns and skin cancer are the major effects of direct exposure to visible light.
5- Bacterial endospores are the most susceptible structures to nearly all types of sterilization.

With our best wishes

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