Mansoura University
Faculty of Science
Zoology Department
May 2016

Second Level (Biology)
Subject: Coelomate Invertebrates&Insects
Time Allowed: 2hr

Answer the following questions with labeled diagrams if possible

Question one : (20 Marks)

A- **From your study** mention the animals which are hermaphrodites and in which the sexes are separate and also give examples for the direct and indirect development.

B- Complete each of the following:

i- The familiar crustacean larva is .....
ii- The mucous girdle containing fertilized eggs after the worm drags itself called.....
iii- Types of setae in *Nereis* are ....., ...and .....
iv- The body wall of annelids is .....while, in arthropods is .....
v- The arthropods are characterized by .....to permit growth and ..... to facilitate locomotion

C- Put (✓) or (✗) :

i- Crustacea is also called Biramia
ii-The appendages of polychaetes are unjointed where they are jointed in crustaceans
iii- Respiration is integumentary in annelids and in some crustaceans
iv- The typical leg in Crustacea is formed of protopodite, exopodite and endopodite
v- There is no head in *Allolobophora*

D- Draw only each of the following : *Lepas* , *Heteronereis* , *Artemia* and body wall of *Hirudo* .

E- Give an account on each of the following:

i- Reproduction of *Daphnia* and locomotion of *Allolobophora* Or *Nereis* .
ii- The stomodaeum in the annelids you have been studied and in *Penaeus*.

Question Two: (20 Marks)

Answer Only Four of the following :

1- Compare between *Iulus* and *Scolopendra*.
2- List the economic importance of Mollusca and Echinodermata
3- Compare between Decapoda and Octopoda.
4- Compare between Dibranchia and Tetrabranchia
5- Mention the most five important characters of Mollusca

Question Three : (20 Marks)

A- Answer the following questions: (2 Marks each)

i- Briefly explain how insect with a hard exoskeleton can go easily through narrow tunnels and spaces ?
ii- By drawing how can you differentiate morphologically between Anopheles and Culex mosquitoes in both sexes ?
iii-Where do you find the eyes, mouth-parts and antennae of an insect ?
iv- List the stages of incomplete metamorphosis.
v- What do you call the functional part of the butterfly mouth-part that sucks up "food/nectar" like a straw ? and from which modified part it originates ?

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B- From your study, kindly identify the functional modification of the appendages for two of the following insects : Collombola , female mosquito and/or Honey bee **(5 Marks)**

C- MCQ : (5 Marks)

(1) What are the main body sections of an insect ?

a) Head and tail **b)** Head, thorax and abdomen **c)** Head , thorax and tail **d)** Head and abdomen

(2) ..... , long estpart, many sub-segments, flexible, articulating basically with pedicel.

a) Antenna **b)** Scape **c)** Maxilla **d)** Flagellum

(3) Insects have a distinct and well developed head region, this phenomena called .....

a) cephalothorax **b)** cephalization **c)** metamorphosis **d)** moulting

(4) The type of head position of locust is .....

a) hypo-gnathous **b)** opistho-gnathous **c)** pro- gnathous **d)** none

(5) The ovipositor of honey bee workers is modified to .....

a) telescope- like organ **b)** attack/defense stinging organ **c)** plant leaves tearing organ

d) piercing & narcotizing organ

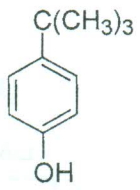
With best wishes

Prof. Dr. Mohamed Fathy Abdel-Aal Mansour
Dr. Zeinab Abou-Elnaga Dr. Sherif Ramadan

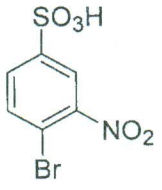
Mansoura University Faculty of Science Chemistry Department Subject: Organic Chemistry (Chem.236)		2nd level Date: 18/5/2016 Time allowed: 2 hours Full Mark: 80 Marks Second Term

Answer the FOLLOWING questions:

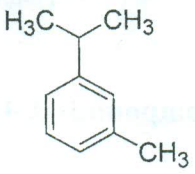
(1) (A) Read Carefully the compounds (1)-(4), then answer the equations: (12 Marks)



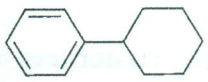
(1)



(2)



(3)



(4)

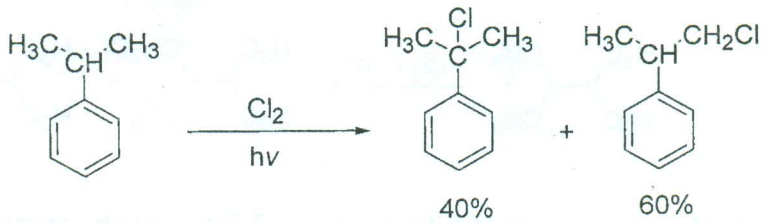
i) Show the product of the reaction of (1) with $(CH_3)_2C{=}CH_2$/ H^+

ii) Diagram the synthesis of (2) starting with benzene

iii) Show the product of the oxidation of (3) with $KMnO_4$

iv) Account for the synthesis of (4)

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



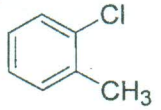
(C) Diagram these Conversions: (9 Marks)

i) $CH_3CH_2CH_2OH \longrightarrow CH_3CH_2CH_2COOH$

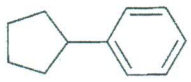
ii) $CH_3COOH \longrightarrow CH_3NH_2$

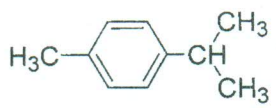
iii) $CH_3COCl \longrightarrow H_3C{-}\overset{O}{\overset{\|}{C}}{-}\overset{H_2}{C}{-}COOC_2H_5$

(2) Predict the organic product(s): (20 Marks)

i) 

$\xrightarrow[H_2SO_4]{HNO_3/}$ .....

ii)  $\xrightarrow{NBS/\ h\nu}$ .....

iii) 

$\xrightarrow{Cl_2\ /\ Fe}$ .....

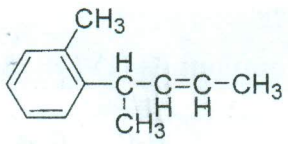
iv) $CH_3CH_2COOAg + Br_2 \longrightarrow$ .....

v) $CH_3COCl + H_2 \xrightarrow{Pd\ /\ BaSO_4}$ .....

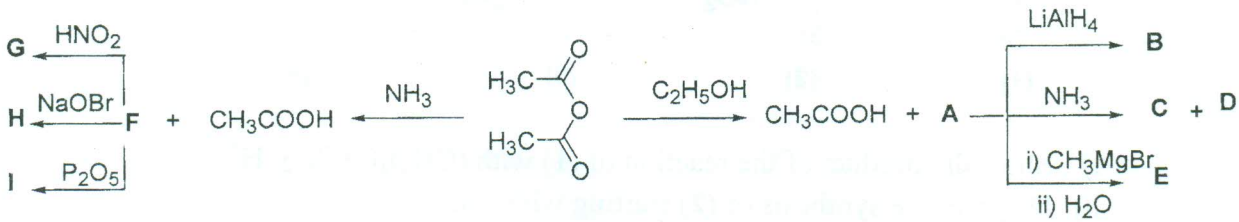
Best wishes

Examiners: Prof. Dr. M. Mansour, Prof. Dr. Ez Kandil, Dr. M. Yosef , Dr. M. El fedawy & Dr. N. Shaker

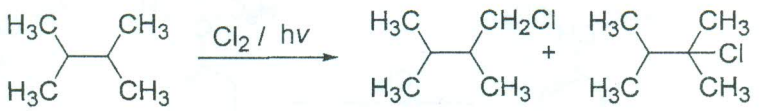
(B) Draw the structures of the possible products of chlorination (Cl_2 / hν) of the compound below, Arrange the sites of reaction in decreasing reactivity: (7 Marks)



(3) (A) Draw the structures of compounds A-I: **(18 Marks)**



(B) It was found that the reactivity ratio between 1° and 3° H atoms in the reaction below is 1: 4.5; calculate the percentage of each isomer: **(6 Marks)**



(C) Diagram the conversion of toluene into 1,3,5-trinitrobenzene (TNB).

(2Marks)

Best wishes

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Mansoura University
Faculty of Science
Zoology Department

Subject: Functional Morphology (Z 203)
Date: 22/5/2016
Time: 2 hours

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

Answer the following questions

Q1: Write a short notice on each of the following: **(15 Mark)**

1- Metabolic conversion of glucose into glycogen in the liver.
2- Gastric and pancreatic digestion of proteins.
3- Physiological functions of vitamins C and its deficiency symptoms.
4- Classification of lipids.
5- Oxidative deamination.

Q2-A) Complete only 6 of the following? **(6 Marks)**

1- .....is used to measure and record of volumes of inspired and expired air. The graph produced is called.....
2- Heart is composed of 2 side by side pumps, each serving as a separate blood circuit; they are..... and .....
3- Heart is located at the superior surface of ..... anterior to the ....., posterior to the ..... .
4- During inspiration; the diaphragm.....,.....and ..... the length of the thoracic cavity.
5- As air moves through the nasal passages, it is ..... and .....before it goes into the lungs.
6- The respiratory unit is composed of ....., ... and.....
7- From the factors responsible for **venous return** are ....., ..., ... and .....

B) Give the scientific term which expresses the meaning of each of the following sentences? **(5 Marks)**

1- Guard bases of largest arteries (aorta and pulmonary) and prevent back flow into associated ventricles.
2- Oidation of food stuffs within cells in presence of oxygen, just to yield energy.
3- The artery which carries low oxygenated blood.
4- It consists of a fibro-elastic membrane which invests the lung.
5- The endothelium that lines all blood vessels.
6- The flow of blood between two sets of capillaries.
7- The circulation of the blood within the heart.
8- Is a flap of cartilage lying behind the tongue and in front of the entrance to the larynx.
9- Is a group of alveoli which open into a common central space.
10- Flat squamous cells, constitute the major of the alveolar lining cells.

C) Give reason(s) for only 4 of the following? **(4 Marks)**

1- **Veins** have valves.
2- Walls of **capillaries** are only made up of a single layer of endothelial cells.
3- 3. Secretion of **mucus** by mucosa of air passages.
4- **Artery** wall has both collagen and elastic fibers.
5- The presence of a thin layer of fluid between the layers of pleura.

Q3-A) Define two only of the following: **(3Marks each)**

1- Reflex arc 2- Nerve cell impulses 3- Neuromuscular junction

B) Compare between each of the following: **(3 Marks each)**

1- Actin and myosin
2- Skeletal and smooth muscle.
3- Different types of neurons.

Q4-A) Choose the one best answer: **(5 Marks)**

1- The hormones of the anterior pituitary gland are:
   1) TSH, GTH, PTH, GH. 2) LH, FSH, GH, TSH.
   3) ADH, PTH, LH, GTH. 4) FSH, GTH, LH, MSH.
2- Angiotensin I is converted to angiotensin II by:
   1) rennin. 2) ACE. 3) ADH. 4) aldosterone.
3- The blood pressure in the glomerular capillaries is about:
   1) 80 mmHg. 2)60 mmHg. 3) 45 mmHg. 4) 25 mmHg.
4- The pancreas is:
   1) an exocrine gland. 2) an endocrine gland.
   3) a non-pure endocrine gland. 4) non of the above.
5- Aldosterone levels in the blood are controlled by:
   1) blood pressure. 2) blood volume.
   3) osmotic concentration. 4) all of the above.

B) Mention the scientific expression for each: **(5 Marks)**

1- Disease resulting from a decrease in insulin secretion.
2- The hormone that regulates the biological clock.
3- Regulation of hormones' levels by other hormones.
4- An apparatus responsible for the secretion of rennin enzyme.
5- A hormone secreted from the fasicular zone of the Adrenal gland.

C) Illustrate the structure of the nephron and mention its role in the urine formation ? **(5 Marks)**

مع خالص الدعاء بالنجاح

ا.د./فريد عبد القادر ا.د./هناء سراج د./ممدوح الصاوي د./ماجدة عرفة

Mansoura University
Faculty of Science
Botany Department

جامعة المنصورة
كلية العلوم
قسم النبات

Final Examination in Botany
Second Term: May- 2016

Educational Year: Second Level **Subject:** B (203)

Course(s): Cytogenetics and Physiology of Plant Growth & Development

Program: Microbiology, Environmental Sciences, Chemistry & Botany and Chemistry & Zoology

Time: 2 hrs **Date:** 25 /5/ 2016 **Full mark:** 60

Answer the following questions:

Part I (Cytogenetics)

Q.1: A- Fill in the spaces using suitable words or phrases: (7.5 marks)

1- Salivary gland chromosomes attain it's huge diameter through the process of .....

2- The ..... represents specific proteins that bind the centromeric DNA and is the site of the spindle fiber attachment.

3- According to the position of the centromere, the chromosomes are classified into.....,.....,.....and.....

4- In cell cycle, the growth stage called.....

5- The ends of chromosomes are called.....

B- Complete the following with a suitable word or phrase: (7.5 marks)

1-In Diplotene the double chromosomes begin to.....and they remain attached at the point of.....

2-In Zygotene the.....chromosomes come together and the pairing process called.....

3-DNA molecule replicates by..... Where one strand directs the synthesis of a new..... strand.

4-When X-rays are focused through..... resulted into a specific pattern called.....which provide information about.....

5-In crossing over, two equal segments of.....exchange and the process takes place during stage called.....

6-In Anaphase 1 the..... separate and each .....moves to the opposite poles whereas in Anaphase II the..... splits longitudinally and each..... moves towards the opposite poles of the cell.

Q.2: A- Complete the following sentences using suitable words: (7.5 marks)

1- There are two main kinds of polyploids.....and..... may be distinguished on the basis of.....

2- ..... is the loss or absence of a section of chromosome and may involve one or more genes.

3- The diploid organisms have one extra chromosome are known as.....

4- Monosomic individual forms gametes of two types ..... and .....

5-.....is a term used to describe a cell with five chromosome complement.

6-..... organisms have two sets of chromosomes in the nuclei of their body cells.

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7- Diploid organisms which are missing two chromosomes are called ....with genomic formula.....
8- Raphanobrassica is a classical example of.....
9- There are two types of deletion.....and.....
10- .....organisms have one set of chromosomes or one genome in the nuclei of their body cells.

B - Choose the correct answer for 8 only: **(7.5 marks)**

1. The four chromosomal banding patterns are.....
   a- C, R, Q , G b- G, B, R, C c- G, Q, R, B d- G, Q, R, S
2. Diagnostic techniques of genetic disorders are .....
   a- FISH b- Banding c- Karyotype d- Bar-body e- All of them
3. In duplication, the wild chromosome loops out during pairing in prophase I.
   a- True b- False
4. The Bar phenotype in *Drosophila* results from which type of duplication
   a- X-linked b- X-limited c- X-influenced d- All of them
5. Unbalanced gene dosage means what?
   a- Change in gene number b- Duplication c- Change in metabolism d- All of them
6. The three steps in an inversion process are what?
   a- Reinsert, invert, turn b- Cut, invert, reinsert c- Cut, turn, invert d- All of them
7. Changing of gene position by translocation leads to changing in gene expression at which levels?
   a- Time, age, gender b- Time, rate, tissue c- Gender, Length, rate d- All of them
8. Dicentric and a centric abnormal chromosomes were produced in gametes after .....
   a- Translocation b- Paracentric inversion c- Pericentric inversion d- All of them
9. In cytological effect of reciprocal translocation, only adjacent I and adjacent II are all types of 3:1 segregation.
   a- True b- False

Part II (Physiology of Plant Growth & Development)

Q1: A- Write the scientific term: (8 marks, 1 mark each)

1. (.....) Seeds with special type of germination which doesn't show a period of quiescence.
2. (.....) The phase accompanying imbibition process where DNA replication and cell division takes place.
3. (.....) A type of seed where the embryo is very small and undeveloped with no food storage.
4. (.....) It is the sum of differentiation and growth.
5. (.....) The embryonic stem below the point of attachment of cotyledons.
6. (.....) It consists of food storage, embryo and testa.

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7. (.....) A stage in seed development in which seed begin to lose water.
8. (.....) A type of germination occurs only in dicot plants.

B- Correct some or all the underlined words: (7 marks, 0.5 mark each)

1. Combinational dormancy caused by exogenous or endogenous dormancies.
2. Primary dormancy caused by exogenous and endogenous dormancies.
3. Stratification is a strategy to break physical dormancy.
4. Mechanical dormancy is a type of dormancy where seed require special light or dark conditions.
5. Soaking seeds in hot water is a way to break chemical dormancy only.
6. IAA can overcome apical dominance.
7. Cytokinins are responsible for the formation of parthenocarpic fruits.
8. Indole acetic acid and adenine are examples of cytokinins and auxins, respectively.
9. All plant growth stimulators function to break dormancy.
10. ABA plays role in closing stomata in plants under normal conditions.
11. Cytokinins are responsible for the formation of adventitious roots.
12. Apical hook in dicot seedlings is formed due to the action of ABA.
13. Dormant seeds are intact unviable seeds that can germinate.
14. Physiological, mechanical and chemical dormancies are types of secondary exogenous dormancy.

Q. 2: Write about each of the following: **(15 marks)**

1- Differentiation, de-differentiation and re-differentiation in plants (3 marks)

2- ABC model of plant flowering (3 marks)

3- Double fertilization during plant reproduction (3 marks)

4- Factors affecting plant vegetative growth (3 marks)

5- Types of plants growth according to its duration (3 marks)

Examiners: **Prof.** Magda I. Soliman **Dr.** Linda Z. Samaan

Dr. Rehab M. Rizk **Dr.** Ashraf Elsayed

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

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Chemistry** **Course(s): Chemical Thermodynamics** **Code: Chem 241**		**Second Term** **2nd Level Students** **Date: 29 may 2016** **Time allowed: 2 hours** **Full mark: 60 marks**

Answer the Following Questions: الامتحان في صفحتين

Question 1: **(21 marks)**

Choose the response that best complete for each statement:

1- Thermodynamic parameter, which is state function and is also used to measure disorder of the system is:
a) entropy b) internal energy c) fugacity d) free energy

2- The change in enthalpy of a system is measured by measuring:
a) heat of the process at constant volume b) heat of the process at constant temperature
c) heat of the process at constant pressure d) none of these

3-Which of the following contains only intensive property:
a) mass b) volume c) internal energy d) density

4- The heat capacity at constant pressure is related to heat capacity at constant volume by the relation
a) $C_P + R = C_V$ b) $C_P - C_V = R$ c) $C_V - R = C_P$ d) $R - C_P = C_V$

5- Which out of the following is incorrect?
a) Work done on the system is –ve b) heat flow out of the system is –ve
c) Heat flow into the system is +ve d) none of these

6- A system that can exchange neither energy nor matter to and from its surrounding is:
a) a closed system b) an isolated system
c) an open system d) a homogeneous system

7- In an adiabatic process ---------- can flow into or out of the system.
a) no heat b) heat c) matter d) no matter

8- From the equation dG = -S dT + V dP. Which of the following expression is true?
a) $\left(\frac{dG}{dP}\right)_T = V$ b) $\left(\frac{dG}{dT}\right)_P = -S$ c) $\left(\frac{dG}{dP}\right)_V = \mu$ d) $\left(\frac{dG}{dP}\right)_T = -S$

9-A process which proceeds of its own accord, without any outside assistance, is called
a) non-spontaneous process b) spontaneous process
c) reversible process d) irreversible process

10-The entropy of a pure crystal is zero at absolute zero. This is statement of
a) first law of thermodynamics b) second law of thermodynamics
c) third law of thermodynamics d) none of these

11- The efficiency of a reversible Carnot cycle is maximum when:
a) Temperatures of hot source and cold sink are maximum
b) temperatures of hot source and cold sink are minimum
c) temperature of hot source is maximum and that of cold sink is minimum
d) temperature of hot source is minimum and that of cold sink is maximum

12- The correct expression for Helmholtz free energy (dA) is
a) -SdT + VdP b) TdS + PdV c) -SdT – PdV d) TdS + VdP

13- The internal energy (ΔE) of process does not depend upon:
a) amount of substance b) temperature c) pass of the process d) all of these

14- The chemical potential for real gas is given by
a) $\left(\frac{dG}{dn}\right)_{T,P}$ b) $\mu^\circ + RT \ln a$ c) $\mu^\circ + RT \ln P$ d) $\mu^\circ + RT \ln f$

15-The mathematical expression for work done in adiabatic reversible expansion is

a) $nC_V\Delta T$ b) $-PdV$ c) $-nC_V\Delta T$ d) PdV

16-A machine that can do work by using heat which flows out spontaneously from a high-temperature source to a low-temperature sink is called

a) Carnot machine b) cyclic machine c) heat machine d) heat engine

17- When water is cooled to ice, its entropy

a) increases b) decreases c) remains the same d) becomes zero

18- A chemical reaction proceeds with decrease in both the enthalpy and entropy. This reaction will be spontaneous if:

a) $\Delta H < T\Delta S$ b) $\Delta H = T\Delta S$ c) $\Delta H > T\Delta S$ d) none of these

19-Which of the following equations is used to calculate the heats of reaction when ΔG at two temperatures is given?

a) Van`t Hoff equation b) Clapeyron equation c)Gibbs Helmholtz equation d) none of these

20-For an ideal gas at constant temperature, the entropy is given by

a) $\Delta S_T = nRln\frac{V_1}{V_2}$ b) $\Delta S_T = C_P ln\frac{T_2}{T_1}$ c) $\Delta S_T = nRTln\frac{V_2}{V_1}$ d) $\Delta S_T = nRln\frac{P_1}{P_2}$

21- At any temperature T, the entropy of a solid substance (S_T) given by the expression

a) $C_P dT$ b) $\int_0^T \frac{C_P}{T} dT$ c) C_P/dT d) $\frac{C_P - C_V}{T}$

Question 2: (From 1-5, each of 5 marks)

1- For molar amounts, the standard Gibbs free energy (ΔG°) for the following reaction:

$2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(g)}$ at 25°C is 2457.14 kJ

In a system where $P_{H_2} = 0.775$ atm, $P_{O_2} = 2.88$ atm, and $P_{H_2O} = 0.556$ atm, determine ΔG then equilibrium constant for the reaction when will be in equilibrium

2- Calculate the work done when 3.5 mol of an ideal gas at 27°C expands isothermally and reversibly from a volume 5 L to 25 L.

3- At 373.6 K and 372.6 K the vapour pressure of $H_2O_{(l)}$ are 1.018 and 0.982 atm respectively. What is the heat of vaporization of water (ΔH_{vap})?

4-An ideal gas at STP is expanded adiabatically from 1 L to 5 L. Calculate the final temperature ($C_P/C_V = 1.4$)

5- Define or explain the following terms:

Molar heat capacities - Gibbs free energy - Van't Hoff isotherm - System and surroundings - Internal energy - Second law of thermodynamics - Chemical potential

6- 2-Derive the following:

a) Van`t Hoff equation b) Derive the Clapeyron equation **(each one 7 marks)**

Best wishes;

Prof. Dr. A.S. Fouda, Dr. G.Y. Elewady and Dr. K. Shalabi

Mansoura University
Faculty of Science
Botany Department
Mansoura - Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة- مصر

Final examination in Botany / Second Term / May 2016

Program (Branch): Chemistry / Botany, Environmental sciences, Chemistry / Zoology & Microbiology
Educational Year: Second level **Subject:** B (204) **Course:** General Microbiology
Date: 5/6/2016 **Time:** 2hrs. **Full mark:** 60 **Question mark:** 20

Answer the following questions (الامتحان في صفحتين)

Q1):

A-Choose the best answer from each of the following :(6 marks)

1- Spirochetes move by means of:
a. Pili b. fimbriae c. Axial filaments d. Slime layer

2- Which of the following structures prevent the desiccation of a bacterium?
a. Fimbriae b. Outer membrane c. Glycocalyx d. Murein layer

3- The main feature of prokaryotic organisms is:
a. Absence of locomotion b. Absence of locomotion
c. Absence of nuclear envelope d. Absence of nuclear envelope

4- Which of the following are contained in the outer membrane of gram-negative bacteria:
a. Teichoic acid b. Lipopolysaccharides c. Peptidoglycan d. Capsule

5- The father of bacteriology is:
a. Louis Pasteur b. Joseph Lister c. Antonie van Leeuwenhoek d. Robert Koch

6- Peptidoglycan is:
a. Consisted of lipids and proteins
b. Found only in gram positive bacteria
c. Regulating entry and exit of the cell via transport proteins
d. Composed of repeating units of N-acetyl glucosamine and N-acetyl muramic acid

B- Discuss and draw the main parts of the flagellum and the flagellar movement. (9 marks)

C- Complete the missing parts: (5 marks)

1- ---------- is the basic unit of classification of living organisms.

2- Peptidoglycan thickness in gram-positive cell wall ranges from----------nm while in gram-negative ranges from---------- nm.

3- D-amino acids present in the murein layer in bacterial cell wall are----------, ---------- and ---------- which resist degradation by----------.

4- The pentaglycine interbridge is found in the cell wall of ---------- bacteria.

5- Gram-negative bacteria is resistant to antibiotics and body fluids due to the presence of ---------- and ----------.

Q2):

A. Complete the following sentences: (7 marks)

1- Culture media are preparations devised to support the ---------- of the microorganisms.

2- The microbial doubling time is ----------.

3- Phosphorus is present in ---------- , ---------- and ---------- as cellular component.

4- In determination of microbial growth, the direct method measure ---------- but the indirect one measure ----------.

فضلا تابع التالي

5- The microbial cultures can be preserved by freeze-drying which is known as ---------- process at ---------- °C and dehydrated in ----------.

6- The halophiles are ----------.

7- The microbial growth means ----------.

B) Differentiate between each of the following (8 marks):-

1- Obligate and facultative microbes.

2- Selective and differential media.

3- Nutrient transport processes in microorganisms.

4- Acidophiles and alkaliphiles.

C- Answer ONLY TWO of the following (5 marks):-

1-Discuss the phases of microbial growth.

2-Discuss the binary fission with a labelled diagram.

3-Write on the classes and practical importance of growth factors.

Q3):

A): Choose the most correct answer (2 Mark, you have one free)

1- The most suitable thermal death measurement for commercial sterilization is----------.

a) TDP b) TDT . c) DRT d) none

2- ---------- are the most resistance of microbes

a) Prions b) Endospores c) Mycobacteria d) Viruses

3- Factors that affect the presence of microorganisms in food include---------

a) Intrinsic b) Extrinsic c) a and b d) none

B): Circulate the correct response; correct simply the wrong one: (4 Mark, you have one free)

1- **(T – F)** Relatively cold temperatures result in relatively high disinfection----------.

2- **(T – F)** Microorganisms play a key role in the stability of food ecosystem only through spoilage.

3- **(T – F)** In nutrient cycling microorganisms act only as producers.

C): Fill the gaps in the following sentences: (2 Mark, you have one free)

1- Effectiveness of germicides classified into ----------, --------- and----------.

2- The production of commercial products through the use of living organisms known as---------.

3- The efficiency of heat as antimicrobial agent depends on ---------- , ----------and ----------.

D): Compare and contrast between only TWO pairs of the following: (4 Mark)

- Batch & Flash pasteurization.
- Antisepsis & Disinfection.
- Thermal death point & Thermal death time.

E): With a clear labeled diagram and commentary notes describe only ONE of the following :- (4 Mark)

- Microbial death rate.
- Mechanisms of antibiotics resistance.

F): Concisely explain only ONE of the following :- (4 Mark)

- Penicillin antibiotic production method on industrial scale.
- Environmental conditions as the main factors affecting the efficacy of antimicrobial method.

With our best wishes

Examiners: - Asst. Prof. Adel A. El-Morsi Dr. Ghada Samir Dr. Ahmed S. Gebreil

الفرقة: الثانيـــــة الشعب: كيمياء-كيم/ح-كيم/ن- جيولوجيا -علوم بيئة-ميكروبيولوجي . المادة: رياضيات بحتة – ر201	كلية العلوم – قسم الرياضيات	دور مايو 2016 الزمن: ساعتـــــان التاريخ: 2016/6/1

أجب على الأسئلة الآتية:

[1] أ. اختبر وجود كل من النهاية التكرارية والنهاية العامة للدالة $f(x,y)=\frac{x^2y^2}{x^4+y^4}$ وذلك عندما تؤول النقطة (x,y) إلى النقطة $(0,0)$. **[10 درجات]**

ب. حل مسألة الشرط الابتدائي : $(x+y)^2\,dx-x^2\,dy=0$, $y(1)=1$. **[10 درجات]**

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[2]أ. إذا كانت الدالة z معرفة كالآتي : $z=\cos^{-1}\left(1+\frac{x^4+y^4}{(x-y)^2}\right)$ ، فاثبت أن $xz_x+yz_y=2(\operatorname{cosec} z-\cot z)$ **[10 درجات]**

ب. اوجد الحل العام للمعادلة : $(2y-\cos x)\,dx+x\,dy=0$. **[10 درجات]**

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[3] أ. اثبت أن قيمة التكامل : $\int_{(0,0)}^{(1,3)}(y^2-4xy-1)\,dx+(2xy-2x^2-3)\,dy$ لا تعتمد على شكل المنحنى الواصل من النقطة $(0,0)$ إلى النقطة $(1,3)$ ، ثم احسب قيمة التكامل. **[10 درجات]**

ب. حل المعادلة : $e^x y'-4xy^2=-e^x y$ **[10 درجات]**

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[4] أ. اوجد الحل العام للمعادلة : $(y^2\cos x+2y\sec^2 x-1/x)\,dx+(2\tan x+2y\sin x)\,dy=0$ **[10 درجات]**

ب. استخدم نظرية "جرين" لتحويل التكامل $\int_c(3x^3-y^3)\,dx+(x^3+5y^3)\,dy$ إلى تكامل ثنائي ، ثم احسب قيمة التكامل الثنائي الناتج ، حيث c هو منحنى الدائرة $x^2+y^2=4$. **[10 درجات]**

أطيب التمنيات بالتوفيق ٦