المستوى الرابع - حيوان كيمياء - فسيولوجى (ز ٤٠٦)

Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology (Z 406)
Courses' Physiology(2)

Second Term
4th Level: Chem.&Zool.
Date: 26-6-2012 الثلاثاء
Time Allowed: 2hr
Full Mark: (60)

Answer all Questions: Each Question [20] Mark

[1]A- Write on the following: (11 marks)

1- Briefly illustrate the mechanism of muscle contraction.
2- Propagation of myelinated and unmyelinated nerve fiber.
3- Ammonia formation in urine.

B- Answer as shown in brackets: (9 marks)

1- Functions of skeletal muscle are ---------- (Complete).
2- Depolarization process. (Discuss)
3- Different threshold type in reabsorbed matter for glomerular filtration.

[2]A- Underline the false word and correct: (10 marks)

1 - Bundle of nerve fiber surrounded by perimyostium.
2 - The space between two successive Z lines is sarcolemma.
3 - Urea is formed through citroline kreb s cycle.
4 - Axon are multiple short processes send impulse to the cell body.
5 - The opposite group of depressor muscle are dialator muscle.
6 - The highest pressure help the process of filtration in urine formation is osmotic pressure.
7- Ascending loop of Henel is permeable to water.
8 - Neuroepithelial junction, where the axon terminal make junction with another neuron.
9 - Acetylcholine is hydrolyzed by arginase enzyme.
11 - The muscle fibers of fast muscle unit have low mitochondrial ATPase.

B- Fill in the blanks: (5 marks)

a- During blood clotting -------(1)-------

prothrombin ⟶ ------(2)------

-------(3-------- ⟶ -------(4--------

b- Decreased plasma albumin results from:
i- -------(5)------- example -----(6) --------
ii- ------(7) ------ example ------(8)--------

c- -----(9)------- is an enzyme inside RBCs, its function is ------(10)----------

d- The three phases of hemostasis are: ----(11)------, ----(12)-------, ----(13)----

e- Two main factors affecting blood viscosity are: ----(14)-------, -----(15)-------

C- Discuss TWO only of the following: (5 marks)

1- Fate of erythrocytes 2- Aplastic anemia 3- Polcythemia

[3] A- choose the correct answer: (12marks)

1- Erythropoiesis in adult individuals occurs normally in the ----------
a-liver b- red bone marrow c- spleen d- yellow bone marrow

2- leukocytes responsible for response to parasitic and allergic infections are ----
a- basophils b- neutrophils c- monocytes d- eosinophils

3- The normal value of the ----------
a- hematocrit (PCV) is 20% b- MCV is about 87 cubic micron
c- plasma volume is about 5 liters d- MCH is about 50 pg

4- The polypeptides in the globin part of normal adult hemoglobin consists of ----------
a- 2 alpha and 2 beta chains b-2 alpha and 2 gamma chains
c- 2 alpha and 2 delta chains d-2 beta and 2 gamma chains

5- The A/G ratio is important clinically in detecting ---------- disease.
a- liver b- cardiac c- nervous d- lung

6- A person withtype AB blood would have --------- antigens on red blood cells, and ---------- antibodies carried in the plasma.
a- A and B; neither anti-A or anti-B b- B; anti-A
c- neither A nor B; both anti –A and anti-B d- A; anti-B

7- All of the following conditions cause anemia EXCEPT ----------
a- acute blood loss b- destruction of bone marrow
c- vitamin B12 deficiency d- living at high altitudes

8- Immunoglobulin are produce by the ----------
a- granulocytes b- monocytes c- erythrocytes d- plasma cells

9- Which sequence is correct for the following stages?
1- mature RBCs 2- late erythroblast 3- normoblast
4- reticulocyte 5- hemocytoblast
a- 1,2,3,4,5 b- 5,3,4,2,1 c- 2,3,5,4,1 d- 5,2,3,4,1

10- Using the dye method, if you know that :
i- hematocrit value = 40% ii- amount of dye injected = 99 mg
iii- concentration of the dye in th plasma = 0.033 mg/ml
The blood volume = --------- liter , Explain why? (2 marks)
a- 2 b- 5 c- 6 d-3

B- Identify FOUR only of the following: (8 marks)
i- Jaundice ii- Megakaryocytes iii- Hematocrit iv- Erythrpoietin
v- Diapedesis vi- HbF

Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology – Code: Z402
Courses: Immunity & Molecular Biology
Academic Year: 2011-2012

Second Term - Final Exam
4th Level Chemistry/Zoology Students
Date: 9 June, 2012
Time Allowed: 2 hrs
Full Mark: 60

Answer All the Following Questions

Q. 1. Discuss the Following Statements: **(15 marks, 5 Marks each)**

1. A. Restriction Nucleases cut DNA molecules at specific sites.

1. B. Bacterial plasmids can be used to clone DNA.

1. C. Transgenic animals carry engineered genes.

Q. 2. Write Short Notes on the Following: **(15 marks, 5 Marks each)**

2. A. Models of DNA replication.

2. B. Production of Human Insulin.

2. C. What genes are made of?

Q. 3. Mark (√) or (X) for the following statements: **(15 marks, each statement of one Mark)**

1- Normal bacterial flora produces inhibitory substances for the microbes.

2- Phagocytosis is the engulfment, digestion, and subsequent processing of microorganisms by macrophages and neutrophils.

3- Bone marrow is a primary lymphoid organ for B cell development.

4- Artificially passive acquired immunity: The injection of already prepared antibodies such as gamma globulin (short-term immunization).

5- Spleen collects antigens from tissues.

6- In primary antibody response the type of antibody is IgG.

7- Acidic pH in adult vagina is one of the defenses against microbes in the acquired immunity.

8- Secondary antibody response has a lag period for hours.

9- T cells produce antibodies.

10 The response in innate immunity is enhanced on repeated exposure to pathogen.

11- Lymphocytes are specialized blood cells that mediate adaptive immunity.

12- Bacterial and viral antigens are considered endogenous antigens.

13- Thymus is a primary lymphoid organ for T cell development.

14- IgM is the first Immunoglobulin made by fetus and B cells.

15- Intercellular infections are mediates by Cell Mediate Immunity (CMI).

Q. 4A. Choose the right answer from each of the following: **(10 marks, each of one Mark)**

1- It is considered one of the mechanical barriers of the innate immunity:

a) Coughing b) Lysozyme in tears c) Normal bacterial flora d) Phagocytes

2- Which Collect antigens from tissues?

a) Bone marrow b) Lymph node c) Spleen d) Thymus

3- The type of Acquired immunity in which antibodies are passed through placenta of the fetus is called……

a) Artificial active b) Artificial passive c) Natural active d) Natural passive

4- Cell- Mediate Immunity (CMI) are responsible for: ……..

a) Resistance to intracellular pathogens b) Resistance to tumors

c) Resistance to fungal and protozoal infections d) all of them

5- A foreign substance, when introduced into human body, stimulate formation of specific antibodies or sensitized lymphocytes:

a) Complement b) Antibody c) immunoglobulin d) Antigen

6- Acute phase proteins are……..

a) Plasma protein b) C reactive protein c) Fibrin d) all of them

7- The protective action of Interferons ……

a) Activate T-cells b) Activate macrophages c) Activate NK d) All of them

8- The function of Properdin is……

a) Complement activation b) Phagocytosis c) Cytotoxcity d) None of them

9- They exist as free cells in blood (monocytes) & fixed cells in tissues (Kupffer) cells of liver

a) Natural killer cells b) T cells c) B cells d) Macrophages

10- The …… kill infected cells.

a) T cytotoxic cells b) B cells c) T helper cells d) Dendritic cells & Macrophages

Q. 4B. Complete the following sentences: **(5 marks each space of 0.5 Mark)**

1- Dendritic cells and macrophage directly kill microbes by …… and other mechanisms. They also help to activate ……

2- - A group of serum proteins that can directly kill pathogens is called ……

3- Immunoglobulin serves as …… for specific antigen.

4- The roles of the immune system include: ……; ……..…; ……..…; and ……..……

5- The two parts of the adaptive immune system are the …… system and the ….. system.

انتهت الأسئلة

With our best wishes,

Dr. Sayed M. Kamel Gomaa - Dr. Mohamed Fathy Abouel-Nour Hegazy

Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology
Course: Cell Biology (Z- 409)

4th level Zoology & Chemistry
Date: 5/6/2012
Time Allowed: 2 hrs
Full Mark: (60 marks)

I) Write (√) or (×): (15 marks, 1 mark each)

1) Proteoglycans are one of the main components of the extracellular matrix ( )
2) The ion channels of the cell membrane is consists mainly of cholesterol ( )
3) The blood tumor marker of Prostate cancer cells is PSA ( )
4) The permeability of gap junctions can be regulated only by cell Ca^{+2} concentration, cytosolic pH levels ( ).
5) Receptor of steroid hormones is an example of intracellular receptors ( )
6) Disulphide bonds is essential for selectins to do their function of cell-cell adhesion ( )
7) Gα is the main active subunit of GPCR responsible for its signaling ( )
8) The Cell receptor Integrins lack kinase domain so it works by activation of downstream targets such as protein kinases ( )
9) cAMP is considered as one of the cell signaling 2_{nd} messengers ( )
10) Ganylyl cyclase is the enzyme involved in PI3K signaling pathway ( )
11) Binding of the acetylcholine to the Na^{+} channels is an example of Voltage gated ion channels ( )
12) Ubiquitination is a multi-step process involves the participation of six different enzymes ( )
13) Absorption of amino acids is improved by alteration of gap junctions ( )
14) Focal adhesion are the connecting site between cell and extracellular matrix ( )
15) Nitric oxide signaling will lead to smooth muscle relaxation of blood vessels ( )

II) Choose the Right answer (20 marks, 2 marks each)

1) Binding of ..... Is crucial for CDKs kinase activity

a) Cdc 25 b) Cyclins c) P16 d) P21

2) Cancer tumor of connective tissue origin is called

a) Sarcoma b) Carcinoma c) Blastoma d) Mesothelioma

المستوى الرابع - كيمياء وحيوان - الفرقة الثانية (ه ٤٢٦)

Mansoura University
Faculty of Science
Chemistry Department
Chem446 (Catalysis&Colloids)

May 2012
4th Level,Chem. Zoology
Time Allowed: 2 hrs
Full Mark: 80Marks

Answer the following questions:

Q1- Choose the correct answer *(10 Marks)*

i. ***Predict the kinetics of a catalyzed reaction which has a $\Delta Go = -60$ kJ/mol?***

a- It will exhibit very rapid kinetics.

b- It will exhibit very slow kinetics.

c- The kinetics of the reaction cannot be predicted.

d- The kinetics depends on the nature of the reactants and/or products.

ii. ***Linear free energy relationship***

a- Relates structure and activity.

b- Predicting rates or equilibria

c- Elucidate reaction mechanism

d- All previous answers are correct

iii. ***Nucleophilic catalysis is catalysis by***

a- General base b- Electrophile c- Proton

iv. ***Lewis base***

a- accept proton

b- gives hydroxyl ion

c- is an oxidizing agent

d- All previous answers are wrong

v. ***In autocatalysis, the reaction is catalyzed by***

a- One of its reactants

b- One of its reactants and/or products

c- One of its products

d- Adding an external catalyst

vi. ***The effect of catalyst on a reversible reaction***

a- Increases the equilibrium constant value

b- Shifts the equilibrium to the right direction

c- Increases the free energy

d- Keeps the same heat content

vii. ***In a colloidal solution_____***

a) the size of a colloidal particle lies roughly between 0.1 nm to 1 nm.

b) the particles have a tendency to settle when the solution is left standing.

c) the particles pass through ultrafilter papers and animal and vegetable membranes.

d) the dispersed phase is uniformly distributed in the dispersion medium

viii. ***Tyndall Effect in colloids is due to _____.***

a) dispersion of light b) merging of light rays c) scattering of light

ix. ***What factor distinguishes a suspension from a colloid?***

a) light reflects off the particles of a suspension

b) the particles of a suspension will sink out if left over time to rest

c) suspensions are clear

d) suspensions cannot be filtered

x. ***An example of an emulsifying agent would be__***

a) oil b) soap c) water d) salt

Q2- Discuss the kinetics of a homogeneous bimolecular reaction (one mechanism). ***(10Marks)***

Q3- V_m for an enzymatic reaction is 5 μmol per minute when 2 μg of an enzyme whose molecular weight is 27.000 is present. What is the turnover number? ***(10Marks)***

Q4- Discuss the Michaelis-Menten equation for enzymes, $v = \frac{v_{max}[S]}{K_m + [S]}$ ***(5Marks)***

Q5- Discuss only two processes contribute to the loss of catalytic activity (*Catalyst Deactivation*). ***(5Marks)***

Q6- What are the advantages and disadvantages of homogeneous catalysts and heterogeneous catalysts? ***(5Marks)***

Q7- Write the Factors that determine choice of catalysts ***(5Marks)***

Q8- Interpret the role of catalyst modifiers ***(5Marks)***

Q9- Predict the effect of pH on K_{obs} for the specific acid and specific base catalysis ***(5Marks)***

Q10- What is the origin of a charge on the colloidal particles? ***(5marks)***

Q11- Draw the Change in concentrations over time for E, S, ES and P in Michaelis-Menten mechanism. ***(5Marks)***

Q12-What do you understand from the variation of α and β, in Bronsted catalysis equation, from 0⟶1. ***(5Marks)***

Q13- Why $MgCl_2$ is a better coagulate than KCl for As_2S_3 ***(5Marks)***

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Organic Chemistry** **Course: Polymer & Environmental Chemistry (Chem 438)**		**Second Term** **Fourth Level – Bio-Chem, Zoology-Chem, & Botany-Chem** **Date: June 30, 2012** **Time allowed: 2 hours** **Full Mark: 60 Marks**

Answer the following questions:

[1] (a) **Define** the polydispersity index of a polymer and **draw** a typical molecular weight distribution curve of a homo- and polydispersed polymers. **[3 Marks]**

(b) **Explain by equations the following statement:**
"The rate of a free radical vinyl polymerization reaction is directly proportional to the square root of initiator concentration". **[8 Marks]**

(c) **Write briefly on** the classification of polymers according to their thermal properties, origin and chain branching. Give examples. **[4 Marks]**

(d) **Mention the main differences** between free radical and condensation polymerization. **[5 marks]**

[2] (a) **Discuss** the molecular weight determination of a polymer by Osmometry, Cryoscopy and Ebulliometry. **[8 Marks]**

(b) **Describe by equations** the general mechanism of the free radical polymerization reactions of styrene in presence of AIBN as initiator and CCl_4 as solvent. **[8 Marks]**

(c) **Show with drawings** the differences between bulk and solution polymerizations. **[4 Marks]**

[3] (a) **Discuss with drawing** the stratification (regions) of the atmosphere. **[7 Marks]**

(b) **Explain by equations** the mechanism of Ozone depletion by Chlorofluorocarbons (CFCs). **[7 Marks]**

(c) There are different types of photochemical reactions occur in the atmosphere. **Write briefly** about **four** of them. **[4 Marks]**

(d) **Mention five** of the most common green house gases responsible for global warming. **[2 Marks]**

With Best Wishes

Examiners:

Dr. Ibrahim M. El-Sherbiny Dr. Mohamed Moneir

كيمياء , كربوهيدرات

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

جامعة المنصورة
كلية العلوم
قسم الكيمياء
المنصورة – مصر

Second Semester: Final Exam. 2012

Educational Year: Fourth Year

Course (s): Carbohydrates Chemistry **Subject: Chemistry**

Date: 19 /June/ 2012 **Full Mark: 80**

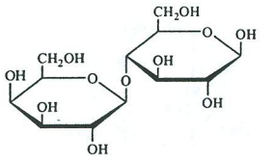
Course Code: Chemistry 434 **Time: 2 Hour**

1- a – The Following disaccharides 1, 2 and 3 consisting of two monosaccharide units:

i- Name the monosaccharide unit & describe each glycosidic bond. [4Marks]

ii- Which of these disaccharides has reducing power (explain by equations in compound 3). [3Marks]

iii- Elucidate the Point of attachment in compound 1.[3Marks]



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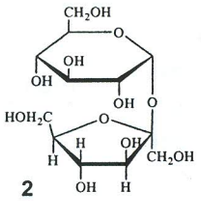

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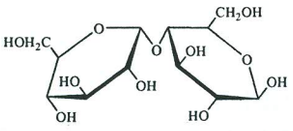

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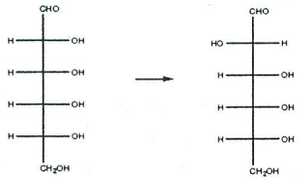


4 5

b- i- Convert epimer 4 to another epimer 5. [4Marks]

ii- Formation of osatriazole from D-Mannose. .[3Marks]

iii- Explain by equation conversion of D-ribose to higher aldose & ketose. [3Marks]

2- Raffinose is a trisaccharide is found in legumes and vegetables.

a- Describe the glycosidic bond in it. [3Marks]

b- What the effect of both acetone and tosyl chloride on aldoso-monosaccharide units obtained by hydrolysis of raffinose. [4Marks]

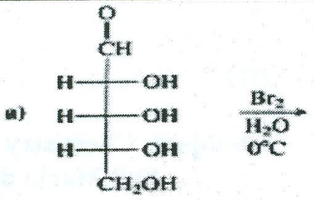
c- How can you elucidate the ring structure of monosaccharide? [4Marks]

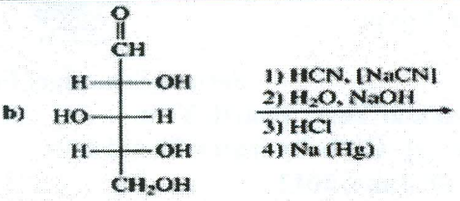
d- Sucrose and maltose are disaccharides; which of them does not undergoes Mutarotation? [4Marks]

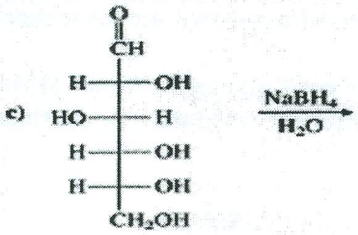
e- Compound (A) in L-form $C_5H_{10}O_5$ reacted with $PhNHNH_2$ gave an osazone, then treated with HCl gave ozone followed by reaction with HCN then hydrolysis and lactonization and finally enolization gave acid (B). Strong oxidation of (B) gave oxalic acid + L-threonic acid . What the structure of (A). [5Marks]

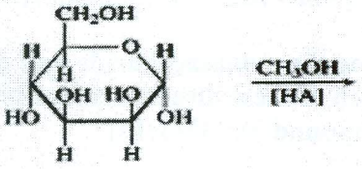
P.T.O

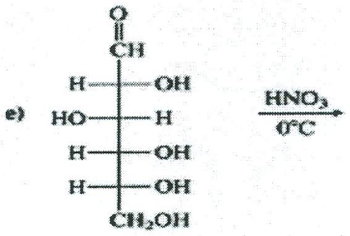
3) **Complete the 5 part of the following equations.[20Marks]**

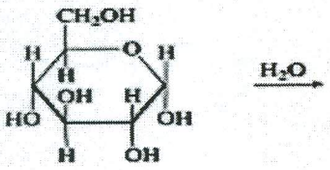
a) 

b) 

c) 

d) 

e) 

f) 

4) a) **Write Fischer projections of: [20Marks]**

i- 3-deoxyD-ribose ii- L-Fucose (6-deoxy-L-galactose).

b) **Which of the following would be expected as reducing sugars? Why?**

i- D-Fructose ii- L-Arabinose iii-sucrose iv –Amylose

v- Maltose vi-cellobiose vii- D-Galactitol

c) **α-D-glucose + 112.0 → + 52.50 ← + 19.0 β- D-glucose**

for glucose above represents

(i) Optical isomerism

(ii) Mutarotation

(iii) Epimerisation

(iv) D and L isomerism

d) **The carbohydrate of the blood group substances is**

(i) Sucrose (ii) Arabinose

(iii) Maltose (iv) Fucose.

e) **Explain by equation, how you can determine the size of ring structure of glucose**

مع أطيب تمنياتنا بالتوفيق

Examiners:

Prof. W.S.Hamama, Dr. S.Shaaban

المستوى الرابع كيمياء نبات
كيمياء حيوان

الكيمياء الإشعاعية، العناصر الانتقالية (الداخلية)

Mansoura University	Second Term
Faculty of Science	4^{th} level chemistry/zoology & botany
Chemistry Department	Date: 23/6/2012
Subject: Chemistry (Chem. 425)	Time allowed: 2 hours
Course(s): Inorganic Chemistry	Full Mark: 80 Marks

"Answer the following questions"

• Question (1):

I- Write short notes on the following: **(15 marks)**

a. Ion exchange method for separation of lanthanides.
b. Complex formation of lanthanides.
c. Extraction of thorium.

• Question (2):

I- Complete the following equation: **(10 marks)**

a. $Ce + O_2 \xrightarrow{heat}$ ....

b. $Eu_2(SO_4)_3 \xrightarrow{electrolysis}$ ....

c. ${}^{235}_{94}Pu + {}^{4}_{2}He \xrightarrow{-2\ {}^{1}_{0}n}$ ....

d. ${}^{238}_{92}U + {}^{16}_{8}O \xrightarrow{-4\ {}^{1}_{0}n}$ ....

e. $UO_2 \xrightarrow{HF}$ .... $\xrightarrow{Al/900\ ^{o}C}$ ....

II- Complete the following statement: **(15 marks)**

a. All lanthanide elements are present in nature except .... which consider to be .... element.
b. Cerium is act as a strong .... agent, while Europium is act as a strong .... agent.
c. All actinides are .... elements, so they dominate the study of .... chemistry.
d. ThO_2 containing 1% cerium give .... by heating in gas flame which used in making ....
e. According to .... , the element with .... atomic number is more abundant than that with .... atomic number.

من فضلك انظر فى الخلف

• **Question (3):**

I- On the basis of VBT predict the geometry of these complexes: $[Fe(CO)_5]$ & $[Ni(CN)_5]^{3-}$. **(10 marks)**

II- Which complex of the following pairs has the larger value of Δ_o &why **(10 marks)**

a. $[Ni(H_2O)_6]^{2+}$ & $[Ni(H_2O)_6]^{3+}$

b. $[Cr(H_2O)_6]^{2+}$ & $[Mn(H_2O)_6]^{3+}$

c. $[Co(H_2O)_6]^{2+}$ & $[Ni(H_2O)_6]^{2+}$

d. $[Rh(NH_3)_6]^{3+}$ & $[Ir(NH_3)_6]^{3+}$

e. $[Co(NH_3)_6]^{3+}$ & $[CoF_6]^{3-}$

• **Question (4):**

I- For the Fe^{2+} ion, the electron pairing energy (P) is about 17,600 cm^{-1} & the crystal field splitting energy values (Δ_o) for the $[Fe(H_2O)_6]^{2+}$ & $[Fe(CN)_6]^{4-}$ complexes are 10,400 cm^{-1} and 33,000 cm^{-1}, respectively.

a. Which of these complexes have high spin configuration?

b. Calculate the number of unpaired electron for each complex & then calculate the μ_s?

c. Calculate the CFSE for both complexes? **(10 marks)**

II- $[Ti(H_2O)_6]^{3+}$ complex is paramagnetic, explain this experimental observation using MOT. **(10 marks)**

• Atomic number:

[Ti=22, Cr= 24, Mn = 25, Fe = 26, Co = 27, Ni = 28, Rh = 45, Ir = 77]

Good Luck

Dr. Rania R. Zaky

المستوى الرابع : كيمياء - كيمياء وبنات كيمياء وجيولوجيا - كيمياء كلية بيئية (ك ٤١٣)

Mansoura University
Faculty of Science
Chemistry Department
Subject: Analytical Chemistry
Course:Environmental Chemistry
Course code: 413

Second term
4th level(Chem. Biology Geology and Botany)
Date:2-6-2012
Time allowed:2 hours
Full Mark:60 Marks

Answer the Following Questions

Q1) (24 marks)

a-Explain, with examples, the effect of toxic chemicals on enzymes.

b- Explain the biochemical effects of two only of the following :

(a) Carbon monoxide

(b) Nitrogen oxides

(c) Sulphur dioxide

(d) Cyanide

and suggest antidotes for each

c- Explain the mechanism of action of insecticides.

Q2) (24 marks)

a- Explain biochemical methylation and illustrate propagation of Hg in food chain

b- What are the broad categories of water pollutants? Discuss

c- Give a concise account of the chemical speciation of (two only

(a)Hg (b) Cu (c) Pb (d) As

in the environment

Q3) (12marks)

a- Define the following :

i) Trace elements ii) Heavy metals iii) speciation iv) BOD

b- Write short notes on:

(i) Sanitary landfill method for waste disposal

(ii) Incineration method of waste disposal

Best wishes