



٥٥ / ٥٥

| | | | | |
|---|---|--------------------------------|-----------------------|-------------------|
|  | TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY | | | |
| | Examination for Seniors (Fourth year) students of double courses | | | |
| | COURSE TITLE: | Analytical Biochemistry | | COURSE CODE: 4149 |
| DATE: 22 -1-13 | FIRST TERM | TOTAL ASSESSMENT MARKS: 50 | TIME ALLOWED: 2 HOURS | |

Answer all the following questions:

- I- Write the chemical structure of octa-peptide consists of : glu-lys-ser-tyr-cyst-trp-ala-gly. If this octapeptide is hydrolyzed into its constituent and subjected to cation exchanger chromatography on column sulphonated polystyrene to separate out amino acids. pI of glu= 3.1; lys=9.74; ser=5.7; tyr=6.42; cyst=5.3; trp=7.8; ala=6.02 and gly=5.97. The pH of solution buffer that is used equal 3. Arrange amino acids eluted from this column. Explain your results. How can identify the amino acids quantitatively and qualitatively eluted from this column. **(10 marks)**
- II- How can you determine the molecular weight of protein by using each of the following: **(10 marks)**
- 1- Mass spectronic methods (MALDI- TOF).
 - 2- SDS polyacrylamide gel electrophoresis.
- III- Fractionate the liver tissue into nucleus, plasma membrane, mitochondria, lysosome, endoplasmic reticulum, golgi apparatus, prxisomes and ribosome by using centrifugation, ultracentrifugation and equilibrium density gradient ultracentrifugation. Clarify the markers are used for confirmed separation of peroxisome, mitochondria, lysosome and plasma membrane **(10 marks)**
- IV- **Clarify each of the following:** **(15 marks)**
- 1- ELISA technique and how can you determine hepatitis C virus by using indirect ELISA.
 - 2- Western blot technique to determine the molecular weight of cytochrome C.
- V- How can you separate eluted protein from diethyl amino ethyl cellulose (anion exchange) by using gradient NaCl and pH. **(5 marks)**

**Many thanks
Best wishes
Prof. Ehab M. M. Ali**

| | | | |
|---|---|----------------------------|---------------------|
|  | TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY | | |
| | INCOMPLETE EXAMINATION FOR CREDIT HOUR STUDENTS | | |
| | COURSE TITLE: LASER CHEMISTRY | | COURSE CODE: CH4113 |
| DATE: 23 JANUARY, 2014 | TERM: FIRST | TOTAL ASSESSMENT MARKS: 50 | TIME: 2 HOURS |

Answer the following questions (5 marks per point):

1- Using suitable diagrams and illustrations, describe each of the following laser systems:

i – Carbon dioxide laser

ii - Excimer laser

iii- Proton transfer dye laser

iv- Bonding in molecular oxygen O_2 and its first two excited states according to molecular orbital theory.

v- Construct the energy level diagram of species in a typical triplet sensitization experiment in which a mixture of naphthalene and benzophenone was irradiated through a 315 nm cut – in filter given the following absorption data:

For naphthalene $S_0 \longrightarrow S_1$ at 385 nm and $S_0 \longrightarrow T_1$ at 465 nm.

For benzophenone $S_0 \longrightarrow S_1$ at 385 nm and $S_0 \longrightarrow T_1$ at 413 nm.

The cut-in filter that absorbs below 315 nm. [Hint: The energy in $k\text{ cal mol}^{-1}$ is obtained as $28500 / \lambda$ (nm)]

2- The synthesis of vinyl chloride from 1,2-dichloroethane is an important multibillion industrial process demonstrating the advantages of laser applications. Write the reaction scheme and mention the advantages of laser application in comparison with thermal applications.

3- The technique of thermal lensing is an important application on laser collimation.

Draw a time- resolved thermal lensing experimental setup and trace upon using the technique to study singlet oxygen sensitization kinetics.

4 - Discuss each of the following:

(a) The technique of Raman spectroscopy showing energy level diagram, the spectral output and band assignment.

(b) The principle of MUCAP reagent operation

(c) Oxygen sensors based on fluorescence quenching

(d) Photodynamic therapy (PDT)

5 - Explain the reason for each of the following:

(a) Carbonyl compounds are common triplet sensitizers

(b) R6G- I^- solutions are strongly fluorescent in ethanol but non-fluorescent in chloroform.

EXAMINER: PROF. DR. EL-ZEINY MOUSA EBEID

لہ کار ہون


| | |
|--|----------------------|
| Tanta university Faculty of science, Chemistry Department Final examination for students of level 4 (chem. sect.) and Level 4 (golo.sect.) and bio chem..section) | |
| Course Title :Textile chemistry | Course code : CH4124 |
| Total Assessment marks : 50 | Time allowed : 2hrs |

Answer the following questions :

- 1- Write an account on each of the following :
 - a- Polyamide fibers and compare and contrast the chemical, physical and mechanical properties of nylon 6,6 with those of aramids fibers .
 - b- Polyester fibers .
- 2- a- discuss the concept of grafting as a means of altering the properties of the original homopolymer. illustrate your answer with examples
b- Cross linking of cellulose and regenerated cellulose for crease resist and permanent press treatments .
- 3- Write an essay on the structural feature of wool-keratin and silk-fibroin .
Compare the chemical , physical and mechanical properties of wool with those of silk .
- 4- Write an account on each of the following :
 - a- The chemistry of cellulose and show the effect of crystallinity on its properties .
 - b- Regenerated cellulose rayons
 - c- Chemically modified cellulosic fibers

Examiner : prof.Dr. F.E.Abdelhay

20/1/20


| | | | | |
|---|--|-----------------------------|----------------------------|-----------------------|
|  | TANTA UNIVERSITY FACULTY OF SCIENCE | | | |
| | DEPARTMENT OF CHEMISTRY | | | |
| | Examination for Seniors (Fourth year) students of biochemistry | | | |
| | COURSE TITLE: | Biological Oxidation | | COURSE CODE: 4117 |
| DATE: 20 -1-14 | | FIRST TERM | TOTAL ASSESSMENT MARKS: 50 | TIME ALLOWED: 2 HOURS |

Clarify each of the following questions by diagrammatically, chemical structure and/or equations:

- 1- Monocytes and neutrophils use oxygen and chloride to kill the bacteria (4 marks)
- 2- Biosynthesis of nitric oxide and their function (4 marks)
- 3- Chemiosmotic hypothesis (4 marks)
- 4- Electron-transport chain in the inner mitochondria, elucidate the complex I, II through ubiquinone and complex III through cytochrome c and complex IV to form water. (8 marks)
- 5- Biosynthesis of ammonia from nitrogen by photosynthesis electron transport and assimilated ammonia in living organism (5 marks)
- 6- Crassulacean acid metabolism (5 marks)
- 7- Photosynthesis carbon reduction cycle (5 marks)
- 8- Z-scheme clarifying formation of NADPH and ATP from light reaction (5 marks)
- 9- Malate-aspartate shuttle (5 marks)
- 10- Inter-relationship between ΔE° , ΔG° and relation of ΔG° to k equilibrium (5 marks)

Best Wishes
Prof. Ehab M. M. Ali

٤٠/٤٠٠

| | | | |
|---|---|----------------------------|-------------------|
|  1969 | TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY | | |
| | EXAMINATION FOR REGULAR B. SC. STUDENTS | | |
| | COURSE TITLE: Solid State Chemistry | | COURSE CODE: 4143 |
| DATE: 14 TH JANUARY, 2014 | TERM: FIRST | TOTAL ASSESSMENT MARKS: 50 | TIME: 2 HOURS |

Answer the following questions (4 marks per question):

1- Draw and carefully label diagrams illustrating each of the following:

- a- An end centered tetragonal Bravais unit cell
- b- The (111) and (110) planes in a cubic unit cell.
- c- The [111] and [110] directions in a cubic unit cell.
- d- The 111 and 110 positions in a cubic unit cell.
- e- A hexagonal unit cell showing the axes and angles.
- f- Different types of liquid crystals.
- g- Phase diagram of the cationic surfactant cetyl trimethylammonium bromide (CTAB) in water showing the hexagonal, cubic and lamellar liquid crystal phases.
- h- The chemical structure of montmorillonite clay.
- i- The electronic and chemical processes occurring in TiO_2 particles upon photocatalytic mineralization of industrial waste water.
- j- Different types of point defects.

2-(a) Given silver crystals having a face-centered cubic (fcc) crystal structure with cell parameters $a = b = c = 4.086 \text{ \AA}$, and its atomic mass as 107.87 g/mol , calculate the density of silver given Avogadro's Number $N = 6.02 \times 10^{23}$ and $1 \text{ \AA} = 10^{-8} \text{ cm}$.

(b) In not more than ten words, define each of the following terms:

A plasmon, a mesogen, an exciton, the aspect ratio (R) of nanorods, the exciton Bohr radius (a_{ex}), an amorphous material, intercalation phenomenon and Burger vector (b).

(c) A reaction product is expected (pre-determined) by the arrangement and packing of the reactant molecules. Discuss this principle taking the photodimerization of trans cinnamic acids as a model.

(d) Discuss briefly the application of polymerized crystalline colloidal arrays (PCCA) in the sensing of Pb^{2+} , Cu^{2+} , glucose and bladder cancer.

3- Give a scientific reason for each of the following:


(a) Protein emission is dominated by tryptophan emission.

(b) Zinc sulphide becomes fluorescent upon heating.

(c) A transparent NaCl crystal becomes colored upon exposure to Na metal vapor.

| | | |
|-----------|----------------------------|--|
| EXAMINERS | PROF. DR. الزينى موسى عبيد | |
|-----------|----------------------------|--|

٥٥٤

| | | | | |
|---|--|-------------|----------------------------|-----------------------|
|  | Tanta UNIVERSITY | | | |
| | FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY | | | |
| | EXAMINATION for Seniors (Fourth Year) students OF Biochemistry | | | |
| COURSE TITLE: | Immunology | | COURSE CODE: BC 4107 | |
| DATE: | JANUARY, 2014 | TERM: FIRST | TOTAL ASSESSMENT MARKS:100 | TIME ALLOWED: 2 HOURS |

1- Explain the following (25 Marks)

- a- Direct Complement fixation test for rubella
- b- Determine the concentration of Ag by indirect ELISA test
- c- Determine indirect Coomb's test.
- d- If we transfer blood with blood group (AB) to patient Blood group (O). Discuss what will happen

2- Illustrate with a diagram of the following (25 Marks)

- a. Immunoglobulin that is only transfer the placenta
- b. The thymus structure and discuss the maturation of thymocyte
- c. Ab concentration in triggering of immune response
- d. Eosinophil, Basophil and neutrophil cells

3- Discuss the following: (25 Marks)


- a. Immune response of large polymeric molecule with multi-repeating Ag-determinant
- b. Eosinophil cationic proteins
- c. Innate immunity in gastric intestinal tract
- d. Sensitization phase of anaphylactic reaction

4- Give account of each the following: (25 Marks)

- a. Forces between Ag and Ab
- b. Biological function of complement
- c. B-cell markers
- d. Serum sickness

أطيب التمنيات بالنجاح و التوفيق

2014

| | | | |
|--|----------------------|---------------------------|---|
| Tanta University Faculty of Science Chemistry Department Double major fourth year section | Industrial chemistry | |  |
| | First Term | Course code: CH4155 | |
| | January 2014 | Total Assessment Marks:50 | |
| | | Time allowed: 2Hours | Date : 8/1/2014 |

(1)- Discuss one of the following

(5 marks)

- The manufacturing process of phosphoric acid from thermal process
- The four raw materials of industrial chemistry

(2)- Select the right answer of the following

(6 marks)

- The raw materials of manufacturing ammonia are
 - Air, water and oxygen.
 - Air, water and, hydrocarbons.
 - Air, nitrogen and, hydrocarbons
- The raw material of hydrogen production from Partial oxidation process is
 - cyclohexane
 - methane
 - sulphoric acid
- The raw material of manufacture of white phosphorus is
 - calcium phosphate
 - barium phosphate
 - Copper phosphate

(3)- Correct the following sentences

(6 marks)

- Hydrazine use as indicator
- In Shift Conversion, the carbon monoxide is converted to carbon
- White phosphorus use industrial strick plate of matchbox

(4)- complete the following sentences

(8marks)


- White phosphorus is chemically active because.....
- The equation of hydrogen manufacture from cook is.....
- The application of phosphoric acid is.....
- The reaction in primary reforming for manufacture of ammonia is.....

(5)- Explain briefly the synthesis of the following:

(25 marks)

- Poly vinyl chloride from ethane
 - Poly styrene from benzene
 - Cellulose acetate from methanol
 - Rubber from crude oil
- (6)**
- Give a brief classification for the types of detergents with examples.
 - The structure of the liquid detergent shampoo, soap and non ionic detergent
 - Preparation of synthetic detergents
 - Powder detergent manufacture.

09P/e

| | | | |
|---|----------------------|----------------------------|---------------------|
|  | Tanta University | | |
| | Faculty of Science | | |
| | Chemistry Department | | |
| Examination for (Credit hours) Students | | | |
| Course Title | Pesticides | Course Code: CH4119 | |
| Date: | January 2014 | Total Assessment Marks: 50 | Time Allowed: 2 hrs |

I) Mark (✓) for the write and (×) for the wrong statements and please correct the wrong one (10 M):

1. Cryolite is injure plant life, while most of fluorides and fluosilicates are safer. ()
2. Bentazon, bromacil and chloramben are examples of insecticides. ()
3. Systematic poison depends on contact of pesticide with the pest. ()
4. Bordo mixture is a mixture of copper oxide and calcium sulfate. ()
5. β-Isomer of gammexane is the most toxic isomer to the insect. ()

II) Choose the correct answer and please write the full chemical equation (10 M):

1. Dehydrochlorination of DDT followed by hydrolysis gives:
 - a) DDA
 - b) Dicofol
 - c) Methoxychlor
2. Effect of heat on γ-isomer of BHC gives:
 - a) 1,2,3-trichloro benzene
 - b) 1,3,5-trichloro benzene
 - c) 1,2,4-trichloro benzene
3. Action of sulphoryl chloride on chlordene in benzoyl peroxide follwed by oxidation gives:
 - a) Chlordane
 - b) Heptachlor epoxide
 - c) Endrin
4. Action of Grignard reagent on p,p-dichloro benzophenone followed by treatment with H₂SO₄ gives:
 - a) bis(p-chlorophenyl)propene
 - b) bis(p-chlorophenyl)ethene
 - c) bis(p-chlorophenyl)methane

III) Write the chemical structure and IUPAC name of the following pesticides (10 M):

1. Anabasine
2. Bentazone
3. DDA
4. Bromacil
5. Paris Green

IV) Carry out the following conversions (10 M):

1. 3-Cyano pyridine into nornicotine.
2. Dicofol into chlorobenzilate.
3. Ethyl alcohol into DDT.
4. Cyclopentadiene into aldrin.

V) Write briefly about each of the following (10 M):

1. Theories explain structure activity relationship of DDT.
2. Insecticidal action of nicotine.
3. Sulfer compounds as inorganic insecticides.
4. Pharmaco kinetics of chloramben.

With Best Wishes, Dr. Atif El-Gharably

ل / ل / ل / ل / ل

Tanta University, Faculty of Science, Chemistry Department.

Final Exam. for the 4th Year Students Course no. CH 4145
(Petrochemicals) Total assesment Marks : 200

Jan. 2014

Time allowed : 2h

Answer the following questions :

1-Show how can you prepare the petrochemicals : (50 Marks)

- | | | |
|------------------|------------------|-----------|
| a-Styrene. | b-D.D.T. | c-Phenol. |
| d- Nylon 66. | e- Ethanolamine. | |
| f-Anthraquinone. | | |

2-Describe with examples : (50 Marks)

- a-Lubricating oils and waxes.
- b-Catalytic cracking.
- c-Hydroreforming.
- d-Synthetic Detergents.

3-Give notes on the followings with equations: (50 Marks)

- a-Thermal cracking.
- b-Isomerization.
- c-Hydrotreating.
- d-Dehydrocyclisation.

4-Discuss giving examples : (50 Marks)

- | | |
|---------------------------------|-----------------------|
| a-Chlorinated phenols. | b-Biphenol A acetate. |
| c-Petrochemicals from ethylene. | |

With best wishes,,

Prof.Ahmed El-Barbary