	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF GEOLOGY			
	EXAMINATION FOR SENIOR (LEVEL FOUR) STUDENTS OF CHEMISTRY/GEOLOGY			
	COURSE TITLE:	HYDROGEOLOGY 1		GE 4111
DATE:	JAN, 2014	FIRST SEMESTER	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions (Sketch maps and diagrams should be drawn whenever possible)

1-Write on Darcy's law and groundwater velocity determination. **(10 Mark)**

2- Discuss about the groundwater flow system and its governing factors.

(20 Marks)

3- Give the definition of the followings: **(20 Marks)**

a- Storage coefficient

b- Hydraulic head and gradient

c- Well efficiency

d- Laminar groundwater flow

4- Write briefly on distance-drawdown pumping test. **(20 Marks)**

5- Using two observation wells and one production well, how could we perform a pumping test for an aquifer **(20 Mark)**

6- Write on water budget equation and discuss water condensation process.

(10 Mark)

EXAMINERS	DR. ZENHOM E. SALEM

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF GEOLOGY

FINAL EXAMINATION for level 4 (Chemistry-Geology) Students

	COURSE TITLE:	Geochemistry		COURSE CODE: 4105
DATE:	JAN., 2015		TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions: (Part I) *(50 marks)*

1- Compare between the following pairs: *(18 marks)*

A-LILE and HFSE.

B-Partition coefficient and ionic optional.

C- Clark and Clark concentration.

D- Element camouflage and element capture.

2- Deduce the significant of the following in geochemistry: *(18 marks)*

A- Rare Earth Elements.

B- Radioactive elements.

C- Chandorites.

D- Light REE.

3- Say Why? *(14 marks)*

A- Forsterite proceeds Fayalite during magmatic crystallization.

B- Despite of Li has an ionic radius similar to that of Mg and Fe^{2+}, it cannot COMPATIBLE with Olivine crystal lattice.

C- A negative Eu anomaly is typical of many continental rocks, as well as most sediments and seawater.

D- If KD is more than one then the con. of the element will decreases with crystallization

Answer the following questions: (Part II) *(50 marks)*

1- Write briefly on the following: *(25marks)*

1- Define the Magma type based on Al_2O_3 saturation

2- Explain Goldschmidt rule for major elements and factors affect the distribution during magmatic crystallization

3- Discuss the geochemical aspects of crystallization of magmas as reveal by reaction series.

4- Compare between the geochemical characteristics of A-type and M-type granites and their tectonic setting.

5- Discuss Siderophile elements and their distribution in the earth.

انظر خلفه من فضلك

	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; try=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, prixisomes 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 GEOLOGY			
	FINAL EXAMINATION for level 4 (Chemistry-Geology) Students			
	COURSE TITLE:	Geochemistry		COURSE CODE: GE 4105
DATE:	DEC., 2013		TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions:

1- Complete the followings: *(32 marks)*

1- Geochemical classification of the elements based on ..... and classified into .....

2- Meteorites are classified into ..... and similar to ..... respectively.

3- Wright alkalinity ratio used for discrimination of .....for ..... rocks.

4- S- type granites are formed in .....setting due to ..... and have ..... magma type.

5- Volcanic arc granites have a ..... magma type and originated in ..... tectonic setting

6- Ni and Cr elements occurs in ..... rocks such as ....., contain high amount of .....element

7- Uranium - thorium mineralization occurs in ..... rocks as..... , contain high amount of ....., ..., ...elements.

8- Within plate granites are .....type granites, formed in ..... setting and have..... magma type.

2- Put √ or × marks and correct the wrong ones:- *(28 marks)*

1- Rhyolite in Cox et al. (1979) volcanic rock classification characterize by low SiO_2 and $Na_2O+ K_2O$.

2- The mantle is mainly formed from lithophile elements whereas the crust is mainly formed from chalcophile elements such as Ca and Li.

3- Oceanic granite is A- type granites, mainly alkali feldspar granites, contains garnet and formed in island arc setting.

4- Chlorine, fluorine and water decreased in the early stage of crystallization.

5- Peraliminous have low Al_2O_3 and high Na_2O, K_2O and CaO.

3- Write briefly on the following: *(40 marks)*

1- Define the Magma type based on Al_2O_3 saturation

2- Discuss Goldschmidt rule and factors affect of distribution of major and trace elements during magmatic crystallization

3- Discuss geochemical aspects of crystallization of magmas as reveal by reaction series.

4- Write on Zonal distribution of the elements in the earth.

5- Discuss the geochemical characteristics of different types of granites

Good Luck

1969	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF GEOLOGY			
	EXAMINATION OF FOURTH LEVEL CHEMISTRY/GEOLOGY STUDENTS			
	COURSE TITLE:	PHANEROZOIC GEOLOGY OF EGYPT		COURSE CODE: GE4103
DATE:	DEC. 28, 2013	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions:

1. Write in details about the Oligocene rocks in Egypt: distribution, facies and paleogeography. (25 marks)
2. Write briefly on the following:
   a. Unstable shelf of Egypt. (15 marks)
   b. Tectonic framework during the Paleozoic. (15 marks)
   c. Economic deposits of the Phanerozoic succession in Egypt. (15 marks)
   d. The Cretaceous/Tertiary contact at the Quseir area, Red Sea coast. (15 marks)
   e. Jurassic rocks at G. Maghara, northern Sinai. (15 marks)

Good Luck!

EXAMINER	PROF. ABDEL MONEM T. ABDEL HAMEED

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY		
	EXAMINATION FOR CRDIT HOUR STUDENTS		
	COURSE TITLE: LASER CHEMISTRY		COURSE CODE: CH4113
DATE:30 DECEMBER, 2013	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME:2 HOURS

Answer the following questions (10 marks each):

1- 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.

2- 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.

3- Using suitable diagrams and illustrations, describe each of the following laser systeme:

i - He / Ne four energy level laser

ii - Excimer laser

iii – Proton transfer dye laser

iv - Solid state laser based on p-n junction.

4 - Discuss each of the following:

(a) The technique of Raman spectroscopy showing energy level diagram, the spectral output and band assignment.
(b) The principal of MUCAP reagent operation
(c) $\Delta E_{S,T}$ in carbonyl and olefinic compounds
(d) Photodynamic therapy (PDT)

5 - Explain the reason for each of the following:

(a) $HClO_4$ and not HCl is commonly used in adjusting pH of dye laser media.
(b) R6G-I^- solutions are strongly fluorescent in ethanol but non-fluorescent in chloroform.

END OF EXAM

EXAMINER: PROF. DR. EL-ZEINY MOUSA EBEID

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

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF GEOLOGY			
	EXAMINATION FOR CHEMISTRY & GEOLOGY STUDENTS (FOURTH LEVEL)			
	COURSE TITLE:	PETROLEUM GEOLOGY		PAPER NO.
DATE:	JAN, 2014	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100	TIME : 3 HOURS

PETROLEUM GEOLOGY
(120 Minutes, Total Marks 100)

Answer the following questions :

(Sketch maps and diagrams should be drawn whenever possible)

1- Write on the surface occurrence of petroleum **(40 marks)**

2- Give reasons on the followings : **(30 marks)**

a) Tertiary rocks are considered to be highly petroleum productive .

c) Clays play a role in transformation of organic matters into petroleum .

d) Surface water causes secondary porosity.

3- Discuss the following subjects: **(30 marks)**

a) Classification of chemical reservoir rocks based on the textures of matrix.

b) Factors affecting permeability.

c) Kerogen types.

EXAMINERS	PROF.DR. NADER ELGENDY	DR SHADIA ABDELRAHEEM

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

INCOMPLETE EXAMINATION FOR CRDIT 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 $S_o \longrightarrow S_1$ at 385 nm and $S_o \longrightarrow T_1$ at 465 nm.

For penzophenone $S_o \longrightarrow S_1$ at 385 nm and $S_o \longrightarrow T_1$ at 413 nm.

The cut-in filter that absorbs below 315 nm. [Hint: The energy in k cal mol^{-1} is obtained as 28500 / λ (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 principal 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

د/ ع مولوسي

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

Answer the following questions (4 marks per suquestion):

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 Å, and its atomic mass as 107.87 g/mol, calculate the density of silver given Avogadro's Number N= 6.02×10^{23} and 1 Å = 10^{-8} 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. ا. د. الزينى موسى عبيد	

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

(1)– Discuss one of the following **(5 marks)**

a) The manufacturing process of phosphoric acid from thermal process
b) The four raw materials of industrial chemistry

(2)- Select the right answer of the following **(6 marks)**

a) The raw materials of manufacturing ammonia are
1- Air, water and oxygen. 2- Air, water and, hydrocarbons.
3- Air, nitrogen and, hydrocarbons
b) The raw material of hydrogen production from Partial oxidation process is
1- cyclohexane 2- methane 3-sulphoric acid
.c) The raw material of manufacture of white phosphorus is
1- calcium phosphate 2- barium phosphate 3-Copper phosphate

(3)- Correct the following sentences **(6 marks)**

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

(4)- complete the following sentences **(8marks)**

a) White phosphorus is chemically active because……..
b)The equation of hydrogen manufacture from cook is……
c)The application of phosphoric acid is……
d) The reaction in primary reforming for manufacture of ammonia is……..

(5)- Explain briefly the synthesis of the following: **(25 marks)**

a- Poly vinyl chloride from ethane
b- Poly styrene from benzene
c- Cellulose acetate from methanol
d- Rubber from crude oil

(6) a- Give a brief classification for the types of detergents with examples.
b- The structure of the liquid detergent shampoo, soap and non ionic detergent
c- Preparation of synthetic detergents
d- Powder detergent manufacture.

	Tanta University Faculty of Science Chemistry Department		
	Examination for (Credit hours) Students		
	Course Title	Pesticides	Course Code: CH4119
Date:	January 2014	Total Asssessment 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. Dehdrochlorination 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 H_2SO_4 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

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF GEOLOGY			
	EXAMINATION FOR SENIOR (LEVEL FOUR) STUDENTS OF CHEMISTRY/GEOLOGY			
	COURSE TITLE:	HYDROGEOLOGY 1		GE 4111
DATE:	JAN, 2014	FIRST SEMESTER	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions (Sketch maps and diagrams should be drawn whenever possible)

1- Write short notes on the followings:- **(26 Marks)**

a- Darcy's law.

b- Vertical distribution of groundwater.

c- Groundwater flow nets.

d- Cable-tool and hydraulic rotary methods for well construction.

2- Give reasons on the followings:- **(24 Marks)**

a- Water-level change maps are important for hydrogeological studies.

b- Increasing the spacing between production wells is necessary to reduce the available drawdown.

c- Laboratory methods and tracer tests can be used to determine hydraulic conductivity. However, results are only approximation because of serious limitations.

3- Explain the following: **(20 marks)**

a- Hydrograph is affected by basin morphometric parameters.

b- Geologic structures and rock types affect drainage types.

4- Write briefly on distance-drawdown pumping test. **(20 marks)**

5- Define the following expressions: **(10 marks)**

a- Drainage density

b- Specific capacity

c- Well loss.

EXAMINERS	DR. MOHAMED GAMAL ATAWIA	DR. ZENHOM E. SALEM

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR LEVEL FOUR STUDENTS (SEMSTER 1) OF CHEMISTRY/BIOCHEMISTRY, GEOLOGY, MICROBIOLOGY, AND ZOOLOGY			
	COURSE TITLE:	BIO-INORGANIC CHEMISTRY		COURSE CODE: CH4159
DATE:	1ST JANUARY, 2014	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOUR

1. **Only by using fully labeled diagram, explain the following (9 marks):**
   b. The role of Selenium in the mechanism of action of Glutathione peroxidase.
   c. The pathway of Vanadium accumulation and mechanism of Vanadium reduction.
   d. Copper homeostasis.

2. **What are siderophores? Mention their types? Give one example for each type? (4 marks)**

3. **List and explain (8 marks):**
   a. The biological functions of Silicon.
   b. The treatment of Cyanide toxicity.
   c. The biochemical basis of Lithium treatment of psychiatric disorders.
   d. The symptoms of Zinc deficiency.

4. **Write the scientific term of the following (4 marks):**
   a. Iron storage protein.
   b. Vanadium-containing compounds.
   c. Proteins that reduce cytoplasmic Zinc levels.
   d. Its synthesis is stimulated by iron overload.
   e. Catalyzes Iron oxidation.
   f. Mediates import of divalent metals.
   g. Chromium binding protein.
   h. An inorganic element that is required only by plants and plays a structural role in plant cell wall.

5. **What physical techniques could be used most efficiently to determine the following (10 marks):**
   a. The presence of a known metal ion in a biomolecule.
   b. Identification of oxygen-iron bonds (Fe=O).
   c. The coordination geometry of heme-containing porphyrins.
   d. The identity of the donor atoms that coordinate the metal ion in a protein.

6. **Describe Na^+/K^+/MgATPase: Flip-Flop-mechanism? (5 marks)**

7. **Choose the correct answer of the following questions (10 marks):**
   i. What is the coordination of proteins to transition metals?
   a. Amino acids bind transition metal-1
   b. Direct coordination to metal active-site
   c. Indirect coordination: cofactors active-site
   d. All of the above

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