

Assiut University

MSc Chemistry

Sept 015

Faculty of Science

631 ch

Times 1.5 hrs

Chemistry Department

Molecular Spectroscopy

Marks 100

ANSWER THE FOLLOWING PARTS A&B

PART A (MARKS 50)

- 1- How can you differentiate between the following molecules from the Infrared spectra?

P-dichlorobenzene

O-dichlorobenzene

m-dichlorobenzene

- 2- How can you differentiate between the cis and trans- conformers of 1,2-dichloro-ethylene using the Raman and the Infrared spectra?
- 3- Derive the nuclear magnetone of a proton in an external magnetic field.
- 4- Discuss the interaction of external magnetic field with an electron and a proton together (H) or separately.
- 5- Derive the Raman Effect from classical point of view.
- 6- State the differences between NMR and ESR.
- 7- Discuss the transition moment for the vibration spectra.
- 8- Discuss the temperature effect on the electromagnetic waves.
- 9- The average wavelength emitted from the sun surface is equal to 500 nm, calculate the temperature of the sun surface.
- 10- What is the importance of the depolarization ration in the Raman spectra?

Prof Dr Anwar El-Shahawy

Assiut University September 2015

Faculty of Science

Time: 1.5 hour

Chemistry Department

Molecular Spectroscopy Exam. (C-631)

For M.Sc. Students

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PART (B)(50 marks) Answer the following:

- 1- From the procedures used to calculate and assess data quality, discuss and explain the following:
Accuracy, Repeatability, Completeness, and Detection limits (LOD, LOQ). (10 marks)
- 2- Briefly write the different kinds of complexes and discuss the spectrophotometric determination of the stoichiometry of ternary complexes. (10 marks)
- 3- What are the main principle of Good Laboratory Practice (GLP) ? (5 marks)
- 4- Discuss the characterization and analytical application of the Ion-Association Complex for (Crystal violet- Cd (II)- Bromopyrogallolred). (5 marks)
- 5- Discuss the Internal and External benefits of the Quality Assurance, and briefly write about the Responsibilities of the Quality Assurance Personnel. (10 marks)
- 6- Write a brief account on the use of (Fe(II)- PV- CTAB) ternary complex for the spectrophotometric determination of iron in Portland cement. (10 marks)

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Good Luck

Prof. Dr. Elham Y. Hashem

Assiut University
Faculty of Science
Chemistry Department

September 2015
Time 1.5 hour

Electrochemistry and Corrosion (C 616) Exam for M.Sc. Chemistry students

Answer the following questions: (20 marks for each)

- 1) Write on the possible galvanic and concentration cells which cause corrosion..
- 2) Explain the factors affecting on the activation polarization.
- 3) What is the general characterization of the pitting corrosion?
- 4) Explain the types and the use of coatings against corrosion.
- 5) Explain the use of inhibitors as a good defense against corrosion.

End

Prof. Abou-Elhagag A. Hermas

قسم : الأراضي والمياه

(امتحان دراسات علیا ماجستیر)

الزمن : ثلاث ساعات

اسم المادة وكودها : كيمياء التربة (٦٠٩)

لجنة الممتحنين: أ.د/ محمد على الدسوقي د/ابوالعيون ابوزيد أمين

أجب عن جميع الأسئلة التالية بإختصار مع التوضيح بالرسم إن أمكن ذلك:

السؤال الأول: (٣٥ درجة)

١- تكلم عن اسباب ملحية التربة و تأثير زيادة الأملاح على نمو النباتات فى الأرضى.

٢- قارن بين معادن طين الفرميكوليت والكاؤولنيت والكلوريت من حيث محصلة الشحنة، الأحلال المتماثل، التباعد الرأسى، السعة التبادلية الكاتيونية والتمدد. (١٠ درجات)

٣- ما هي صور الحموضة في التربة ومع شرح مصادر الحموضة والقلوية في التربة. (١٠ درجات)

٤- عرف عملية الإدمصاص مع المقارنة بين أنواع الإدمصاص المختلفة في التربة (٧ درجات)

السؤال الثاني: (٣٥ درجة)

١- إذا فرض أن معادن (A) ، (B) ، (C) هي المتحركة في ذوبان عنصر الفوسفور في محلول التربة ومعدن (A) أعلي في حاصل الإذابة من معدن (C) وكلاهما أعلي في حاصل الإذابة من معدن (B)، فعند الزمن صفر يكون أياً من تلك المعادن هو المتحكم في ذوبان العنصر في التربة أما بعد زمن (س) فيكون أياً من تلك المعادن هو المتحكم في ذوبان العنصر في محلول التربة (مع الشرح باختصار).

(۱۰ درجات)

٢- تكلم عن مصادر الشحنة السالبة لمعادن الطين والمواد العضوية في التربة. (٨ درجات)

٣- عرف الطبقة الكهربائية المزدوجة مع شرح مختصر للنظريات التي قامت بتفسيرها. (١٠ درجات)

٤- اذكر اليات عملية التنظيم فى التربة مع شرح أهمية السلوك التنظيمى فى التربة. (٧ درجات)

السؤال الثالث: (٣٠ درجة)

١ - عرف التبادل الكاتيوني مع شرح علاقته بخصوبة التربة.

٢- ما هو الدور الذى تقوم به المادة العضوية فى التربة.

٣- اشرح العلاقة بين $pe-pH$ فى التربة والأنظمة الحيوية. (٦ درجات)

٤- اشرح العلاقة بين تركيز مكونات محلول التربة ومكونات التربة الأخرى مع التوضيح بالرسم (٨ درجات)

أنتهت الاسئلة

مع تمنياتنا بالتوفيق،،،،،،،،،،

لجنة الممتحنين: أ.د/ محمد علي الدسوقي

د/ابوالعیون ابوزید أمین

Organic Chemistry MSc. Examination
Chromatography

(I) Answer the following questions:

(1) Give an account on **Four** only of the following:

- a) Ion exchange resins used in deionization of water.
- b) Use of the following derivatives in chromatography: Dansyl amino acids, phenyl urethanes.
- c) Visualization of the following classes of organic compounds in T.L.C. ; PAH, monosaccharides.
- d) Difference between capillary columns and packed columns.
- e) Factors affecting separation in G.L.C.

(2) Describe an H.PLC. experiment suitable for analysis of a mixture that may contain:

Diphenyl amine, aniline, acetanilide and p-toluidine.

Good Luck,,,



Department of Chemistry

C-638: Special Course "Analytical Chemistry" Final Exam

For M. Sc Student: *Hanan Hassan Mohammed*

12th Sep 2015

Time allowed: 3 hours

Answer the following questions: (100 marks)

1) Complete the following sentences:

- a) HPLC columns consist of two components, -----
----- and the ----- in which the
stationary phase is founded.
- b) Stationary phase or packing materials for HPLC columns can be based on
either ----- or -----.
- c) inorganic ceramics used are predominantly -----.
Inorganic packing has a high rigidity and do not swell in any solvent.
- d) The term "Reversed-Phase" chromatography refers to -----
-----,
-----, while adsorption "Normal Phase" chromatography is --
-----.
- e) The normal operating back pressure of a column varies considerably and
is affected by -----, -----,
-----.

1. Define the following terms:

- | | |
|------------------------|------------------------------------|
| a) HPLC-peak tailing | b) Embedded polar group technology |
| c) Column Efficiency | d) Peak asymmetry (As) |
| e) Column conditioning | f) Equilibrating the Column |

- 2. Write short note on the HPLC - packing specifications.
- 3. Discuss how you can test the column efficiency and calculate the column back pressure.

Good Luck

Examiner: Prof Nagwa Abo EL-Maali

Assiut University

Sept. 2015 .

Faculty of Science

Time: 3 hours

Chemistry Department

Examination of Physical Chemistry (Special course C- 625)

for M. Sc. Student

Answer the following questions:

- I) a- Write an account on the theory of charge transfer complexes.
- b- Explain briefly the various methods applied for determination of the formation constants and molar extinction coefficients of the formed CT complex.
- c- Discuss briefly the different factors affecting the stability of the CT complexes.
- d- How can you elucidate the structure of the CT complexes ?
- II) Discuss briefly **Only Two** from the following:
- a- Ion – solvent interactions.
- b- Acid – base interactions in amphiprotic media.
- c- The electrostatic free energy.

Good Luck

Prof. Dr. Maher M. A. Hamed

1-Assiut University

MSc Physics

Sept 2015

Faculty of Science

636 ph

Time:3 hrs

Chemistry Department

Molecular Spectroscopy

Marks: 100

The hundred marks are equally divided between the following questions.

- 1-Derive the symmetry species of vibrational normal modes of ethylene molecule in the Infrared and Raman Spectra individually. State its point group.
- 2-What are the differences of the transition moment between Infrared and Raman spectra ?
- 3- Derive Raman Effect from classical point of view.
- 4- Derive the symmetry species of bonding Eigenfunction ψ_1 and the anti-bonding Eigenfunction ψ_2 of ethylene molecule and derive the symmetry species of the electronic excited state.
- 5- Determine the following properties of the two possible conformers of 1,2-Dichloroethylene:
 - a)- The symmetry point group to which they are belonged.
 - b)- The symmetry species of the vibrational spectra.
 - c)- The symmetry elements of the two conformers.
- 6- Calculate the reduced mass of $\text{N}^{14}\text{O}^{16}$ molecule and its moment of inertia if its bond length being equal to $1.151 \text{ \AA}$. Find out the radar wave length λ required to promote the molecule from $J=0$ to $J=1$. ($h=6.626 \times 10^{-34} \text{ Js}$, $c=3 \times 10^8 \text{ ms}^{-1}$)
- 7- Discuss the planar normal coordinate analyses of H_2S molecule.
- 8- Discuss the symmetry elements multiplication table of the C_{3v} point group.

Good Luck

Prof Dr Anwar El-Shahawy

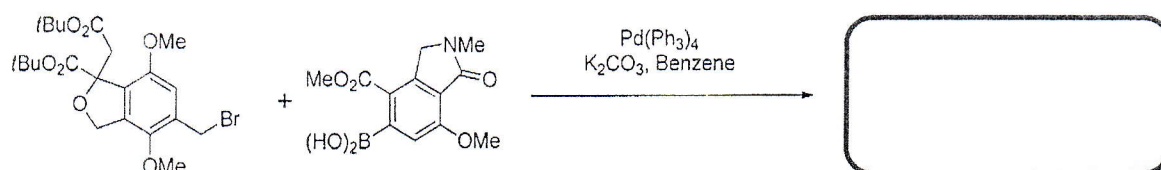
Organic Chemistry Examination for Postgraduate Students
(Advanced synthetic organic chemistry 643C)

Answer the following questions

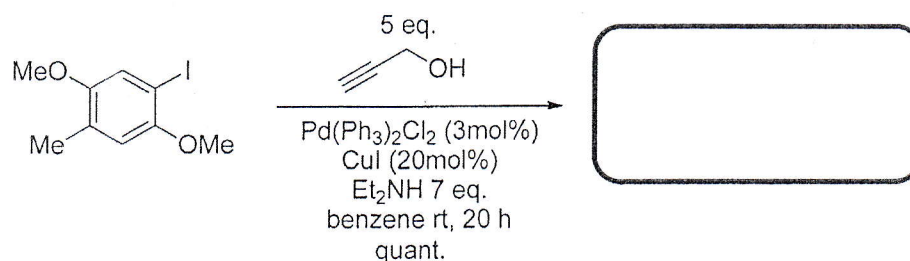
1- Write on the following cross- coupling reactions, give examples.

- i- Buchwald- Harwig reaction .
- ii- Heck reaction .
- iii- Sonogashira reaction
- iv- Ullmann Reaction .

2- a- Fill- in the missing structures:



What function does the base provide?



What function does the CuI salt provide?

Natural Products Exam. Of M.Sc. Students of
Organic Chemistry 644-C

Answer the following questions:

- I- a) Give short notes on the stereochemistry of the following compounds: (10 Marks)
- | | |
|----------------------------------|-----------------|
| 1) Riboflavin (vitamin B2) | 2) Adrenaline |
| 3) Folic acid | 4) Progesterone |
| 5) Pantothenic acid (vitamin B5) | 6) Oestriol |
- b) Illustrate a method of preparation of 3,5,6 (10 Marks)
- II- a) Starting with naphthalene show how can you use Haworth method for preparing 1-methyl and 3-methyl phenanthrene. (10 Marks)
- b) Give an example for using internal and external friedel-craft's reactions to synthesize polynuclear hydrocarbons. (10 Marks)
- III- a) Write short notes on glycosides, classify it according the type of aglycone, give an example of each. (10 Marks)
- b) Write on Ruberythric acid, give one method for its synthesize. (10 Marks)
- IV- Shikimates are group of natural products the majority of which are aromatic
- a) Classify the different groups of Shikimates, give an example of each. (10 Marks)
- b) Formulate one method for preparing lignans. (10 Marks)
- V- Isoflavones occur naturally, but are not wide-spread as the flavones, they occur either In the free state or as glycosides.
- a) Discuss the effect of potassium hydroxide on daidzein. (10 Marks)
- b) Explain one method for preparing daidzein. (10 Marks)
-

Good luck,,,

M.Sc. Final Examination September 2015

✓ Advanced Organic Synthesis

C 643

9/9/2015

Time: 1.5 hour

Answer the following questions:

(50 point)

- 1- Protection for the hydroxyl group, including 1,2- and 1,3- diols is highly essential in organic synthesis: Give examples for protection and deprotection of these hydroxyl organic derivatives.
- 2- Phenylalanine is highly important α -amino acid for protein synthesis (cf. molecular structure)



- a) Point out reactive groups in this molecule.
 - b) Write on the protection and deprotection of these reactive groups.
 - c) Acyclic and cyclic acetals or ketals are the most useful protective groups for the carbonyl group: Give examples for protection and deprotection.
-

Good Luck,,,

الممتحن: أ.د. سعود عبد المنعم محمد متولي

Answer the Following Questions:

1) Write on the following: :

(25 Marks)

- a-i- Explain the use of cyclic voltammetry for estimating the values of E^0 and n (number of electrons) for a reversible system.
- ii-What is the relation between $E_{p/2}$ and $E_{1/2}$
- b-Discuss the dependence of i_p on scan rate and concentration and of E_p on scan rate for the following electrode processes in linear sweep and cyclic voltammetry (reduction assumed):
- i- reversible
- ii- irreversible
- c-i-Ilkovic equation and its applications in chemical analysis.
- ii-Calculate the limiting current that would be expected from the reduction of $2 \times 10^{-4} \text{ M Pb}^{2+}$ using the D.M.E. Characteristics:
 $m=8\text{mg/drop}$, $t=4\text{sec}$ and $D=1.01 \times 10^{-5} \text{ cm s}^{-1}$

2) Write briefly on only Two of the following: :

(25 Marks)

- a-Differential pulse voltammetry
- b- Square – wave voltammetry
- c- Adsorptive stripping voltammetry

أنظر خلفه باقي الأسئلة

3) Answer the following:

(25 Marks)

- a- Give the theoretical bases of zero-crossing technique.
- b- Fe(III) can be determined spectrophotometrically through its complex with KCNS, $(FeSCN^{2+})$ complex, has a molar absorptivity of $7 \times 10^3 L mol^{-1} cm^{-1}$ at 580 nm. A 2.5 ml aliquot of a solution containing 3.8 ppm iron (III) is treated with an appropriate excess of KCNS and diluted to 50 ml. What is the absorbance of the resulting solution in a 2.5 cm cell? (Atomic weight of iron = 55.84)
- c- Infrared spectroscopy can be used as a tool for quantification of air pollutants. Give examples.

4) Answer only Three of the following:

(25 Marks)

- a- Write briefly on:
- i- Wavelength accuracy.
 - ii- Spectrophotometric determination of fluoride.
- b- For environmental analysis, special methods must be used to concentrate the materials. Explain.
- c- What are the mechanisms by which a metal-complex can absorb radiation.
- d- 0.1 mg of anthracene ($C_{14}H_{10}$, RMM=178) dissolved in $100 cm^3$ of dry cyclohexane and placed in 1-cm cell, gave an absorbance maximum at 256 nm with $A=1.01$. If 1g of dry soil was extracted with a total $100 cm^3$ of dry cyclohexane and gave an absorbance of 0.32 under the same conditions, what was the concentration of anthracene in the soil in mg/kg?

Good luck

Examiners : Prof.Dr. M.A.Ghandour

Prof. Dr. H. Sedaira

Assiut Univeisty

Faculty of Science

Chemistry Department

2015

Electrochemistry Examination for M.Sc.Students

Answer the following Questions

- 1) (a) Discuss the reduction to the metallic state of a complex ion of a metal that is soluble in Mercury.
 - (b) Discuss thermodynamic interpretation of the half wave potential of simple metal ions.
 - 2) (a) Discuss the reduction and oxidation of metal ions from one oxidation state to another at the dropping Mercury electrode.
 - (b) Discuss the theory of pulse and differential pulse polarography.
-

Assiut University
Faculty of Science



September 2015
Time: three hours

Chemistry Department

Master degree exam in ~~Special~~ course for Estabrak Ibrahim Hussein,
M. Sc. Student

Answer the following questions:

1. Write on:

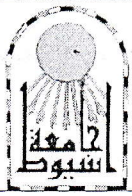
- A. Write on the chemical composition of dates.
- B. Chemical composition of dates seeds.
- C. Nutritional value of date.
- D. Sugar content of dates.
- E. Fatty acids composition of dates.

2. Date palm fruits processing and by-products:

- a. Date syrup.
- b. Production of high-fructose syrup (HFS).
- c. Bioactive compounds and high significance.
- d. Ethanol production.

Good luck

Prof. Dr. Adel Mohamed Kamal El-Dean

	Pre- Master Exam in Biochemistry (651C) Marks: 100 Time: 3 Hours Date: 5/9/2015	
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I- Write on Five only of the following (50 marks; 10 marks each)

- 1- Hyaluronic acid
- 2- Biological significance of PUFAs
- 3- Cytokines
- 4- Gene regulatory protein
- 5- Bonds responsible for protein structure
- 6- Folic acid

II- By labeled diagram show the route of absorption, distribution, and excretion of potentially toxic substances (15 marks)

III- Discuss the following (35 marks)

- 1- Nomenclature and classification of enzymes. (15 marks)
- 2- Metabolic activation of amino acids. (10 marks)
- 3- Biochemical markers of eukaryotic cell organelles. (10 marks)

Good Luck!

Dr. Hossam El-Din M Omar, Prof. of Physiology

2Assiut University

MSc Physics

Sept 2015

Faculty of Science

639 ph

Time 3 hrs

Chemistry Department

Special Course

Marks 100

The hundred marks divided equally between the following questions:

- 1- Derive the vibrational thermal energy of diatomic molecule using vibrational partition function.
- 2- Derive the rotational partition function of diatomic molecules hence the characteristic rotational temperature.
- 3- Calculate the collision density of O_2 molecules under pressure 1 bar at $27^\circ C$, calculate its viscosity and its thermal conductivity if you are informed that $C_v = \frac{3}{2} R$ for ideal gas. ($R = 8.31 \text{ J mol}^{-1}$, $\sigma = 0.361 \text{ nm}$, $N = 6.023 \times 10^{23} \text{ mol}^{-1}$)
- 4- Derive the concentration of the reactants activated complex at the top of the energy barrier along the reaction coordinate.
- 5- Using simple collision theory for the reaction between one mole of $H_2(g)$ and one mole of $O_2(g)$ to produce two moles of $HI(g)$, derive the rate constant of the reaction and the frequency factor.
- 6- Derive the maximum concentration of the intermediate substance of the following consecutive reaction: $A \rightarrow B \rightarrow C$
- 7- Derive the rate constant of the successive reaction between one mole of H_2 and one mole of Br_2 . The reaction was initiated by uv photon.
- 8- A) Derive the relative mean velocity of two different molecules.
B) Calculate the relative mean velocity of $H_2(g)$ and $O_2(g)$ molecules at $27^\circ C$ and pressure 2 bars. ($H = 1$, $O = 16$)

Good Luck

Pro Dr Anwar El-Shahawy

3Assiut University

MSc Chemistry

Sept 2015

Faculty of Science

639 ch

Time 3 hrs

Chemistry Department

Special Course

Marks 100

ANSWER THE FOLLOWING PARTS A&B.

PART A (Molecular Spectroscopy) MARKS 50

- 1- Derive the symmetry species of the bonding Eigenfunction ψ_1 and the anti-bonding ψ_2 of ethylene and derive the symmetry species of the electronic excited state of the same molecule.
- 2- A- Calculate the reduced mass and moment of inertia of HCl^{35} molecule of bond length being equal $1.283 \text{ \AA}$.
B- Calculate the frequency in cm^{-1} in the microwave spectrum between the energy levels $J = 0$ and $J = 1$. ($h = 6.626 \times 10^{-34} \text{ Js}$, $c = 3 \times 10^8 \text{ ms}^{-1}$)
C- Calculate the separation in cm^{-1} between the energy levels $J=1$ and $J = 2$ for $\text{C}^{12}\text{O}^{16}$ molecule of bond length being equal $1.131 \text{ \AA}$.
- 3- Discuss the electric quadripole moment for anisotropic and isotropic molecules.
- 4- Give short note about the experimental technique of the nuclear quadripole resonance and the contribution of the s-electron and p,d-electrons in the EFG.
- 5- For the $\text{Cl}_{(g)}$, the first excited state of $g=2$ is 875 cm^{-1} higher than the ground state Of $g=4$ at temperature 27°C , what is the ratio between the number of atoms in the excited state with respect to the number of atoms in the ground state.

$$(k = 1.38 \times 10^{-23} \text{ JK}^{-1})$$

Prof Dr Anwar El-Shahawy

**Final Examination For M.Sc. Student (special course) in Free
Radicals Reactions (654 C)**

Answer the Following Questions

1. Write by details in the following:

- Spin trapping technique and disroptionation process.
- Suggest the suitable mechanism in the neat thermolysis of benzophenone hydrazone at 250°C and / or isoquinoline as trapping agent.
- Explain the photocatalyzed rearrangement of addition hydrogen bromide to trichloropropene.
- Flash photolysis and ESR technique.
- Discuss the using of Fenton's reagent as catalyst on tertiary butanol.

2. Explain by details the following:

- The fate of the following radicals:
p-Tolyl, Phenylsulfonyl, Phenylthiyl, Desyl, Phenoxyethyl.
- The persistent of oxygen radicals and give an example.
- Suggest the suitable mechanism in the thermolysis of neat N-p-tolylbenzamidoxime at 250°C and/or tetralin as solvent.
- Synthesis of N-bromosuccinimide through bromination of cyclohexane.
- The reaction of HCl on propylene at 400°C.

Good Luck

مع تمنياتي بالتوفيق والنجاح
أ.د. عبدالعال جابر

Final examination of advanced inorganic chemistry for master degree students(C-615)

Answer the following questions

Section I (50 Marks)

- 1.a) Which of the following has a 4-fold rotation axis of symmetry and which has a 2-fold axis?
Hexagonal system, rhombohedral system, tetragonal system, $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$, $[\text{PtCl}_4]^{2-}$ (square planar), $[\text{CoCl}_4]^{2-}$ (tetrahedral).
- b) Define each of the following
Space lattice-unit cell-polymorphous metals-tetrahedral and octahedral sites in close packed lattices.
- 2.a) Prove that 74% of the space in face-centered cubic structure is actually occupied by the atoms using the Pythagoras Theorem.
- b) Write a comparison between metallic and covalent crystalline solids taking into account the structural units, type of bonding and conductivity. Give two examples for each.

Section II (50 Marks)

- 3.a) " π - π Stacking is a type of non-covalent bonding occurring in some supramolecular compounds". Suggest a mechanism to indicate its operation in these compounds.
- b) Write on two methods for the preparation of the carborane derivatives $\text{B}_{10}\text{H}_{10}\text{C}_2\text{RR}'$.
- c) "Reaction of 2-formylphenoxyacetate and 3-aminobenzamidinium produces an interesting self replicated compound". Give the different steps leading to formation of this compound.
4. a) Draw the hydrogen bonded structure arising from mixing melamine and cyanuric acid.
- b) Give a reaction producing the ion $\text{B}_9\text{C}_2\text{H}_{11}^{2-}$ from $\text{B}_9\text{C}_2\text{H}_{12}^-$ ion. Show the symmetrical structure of the complex $(\text{B}_9\text{H}_{11})_2\text{M}^{n+}$.

Good Luck

Examinars: Prof. Dr. Aref A. M. Aly
Prof. Dr. Said A. Ibrahim



Faculty of Agriculture
Genetics Department

Examination : Principles of Biochemical Genetics (608 B)
Postgraduate Students (Preliminary M.Sc)



Assiut University

Time : 3 Hours

Examiner : Prof . Dr. Fathy saleh

ANSWER THE FOLLOWING QUESTIONS :

The first question : (18 Marks – 3 Mks for each)

Give reasons for each following statement:

- a . Using of Taq- polymerase in PCR technique.
- b . Sterilization by UV-light must be conducted in a dark room.
- c . Areas of DNA that are rich in guanine and cytosine need high energy to separate from each other .
- d . Studying of the microorganisms in genetics .
- e . Formation of Okazaki fragments .
- f . Genetic code is triple (each one has three bases) .

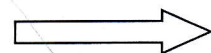
The second question : (24 Marks– 3 Mks for each)

Briefly , what is the difference between each two terms of the following ?? :

- | | | |
|-------------------------------|---|---------------------------------------|
| a . β - galactosidase | & | Permease |
| b . Spontaneous mutation | & | Induced mutation |
| c . Primary mRNA | & | Mature mRNA |
| d . Positive selection | & | Negative selection |
| e . DNA- polymerase | & | RNA- polymerase |
| f . F^+ -strain | & | Hfr - strain |
| g . Transduction | & | Transition |
| h . $trp^+ leu^+ his^- str^s$ | & | Arg^+ , Ade^- , Met^+ , Pen^r |

The third question : (18 Marks)

- b . A gene contains 141 codons. How many nucleotides are present in the gene's coding sequence? How many amino acids are expected to be present in the polypeptide encoded by this gene? (12 Mks)
- c . If the A-T content of a double stranded DNA molecule is 28 % , what are the percentages of all four bases (A, C, G, T)? (6 Mks)



Fathy Saleh

The fourth question :

Re-write after filling the first following table with helping of the 2nd one : (15 Mks)

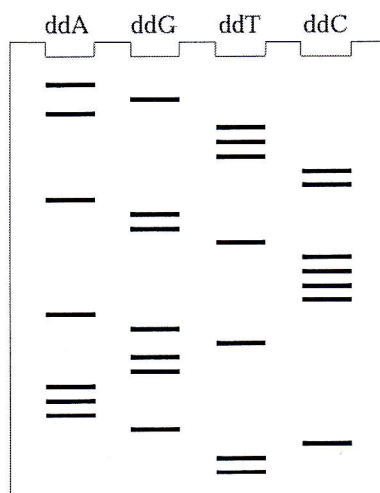
C					C	G			A	C	T	DNA double helix
G		A					G	T			A	
	C					C	G		U		A	mRNA transcribed
	G	U			C			A			U	Appropriate tRNA anticodon
			Trp									Amino acids incorporated into protein

AUU = Ile GCA = Ala CGU = Arg CUA = Leu CCA = Pro

UUG = Trp UCU = Ser CAU = His ACU = Thr GGU = Gly

The fifth question : (25 Mks)

A cloned fragment of DNA was sequenced by using the dideoxy method. A part of the autoradiogram of the sequencing gel is represented here.



- Deduce the nucleotide sequence of the DNA nucleotide chain synthesized from the primer - and Determine the polarity of the ends ?? (10 Mks)
- Deduce the nucleotide sequence of the DNA nucleotide chain used as the template strand - and Determine the polarity of the ends ?? (10 Mks)
- Write out the nucleotide sequence of the DNA double helix and their polarities . (5 Mks)

With my best wishes

Prof. Dr. Fathy Saleh

Fathy Saleh

**Examination of Biochemistry (651 Chem.) for students
Preparing for M.Sc. degree in chemistry**

Answer the following **Three** questions:

- Q.1. Draw the biochemical reactions involved in the transformation of glucose into lactic acid in humans giving the names of enzymes and coenzymes used.**
- Q.2. Write on uronic acid pathway and its biochemical importance.**
- Q.3. a) Show by chemical formulae how is acetyl coenzyme A is transformed into mevalonic acid.**
- b) Write on transamination enzymes and their clinical importance.**

Good Luck,,,