


علو مراد

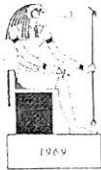
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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY				
EXAMINATION for Seniors students (Fourth Year) students of Material science					
COURSE TITLE:	Applied Polymer Chemistry تطبيقات البوليمرات			COURSE CODE: CH4222	
DATE:	MAY 25 TH 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS	

Answer the following questions:

- 1- Draw a comparison of release profiles for controlled release formulations with other methods of drug administration (therapeutic window). **10 marks**
- 2- Write notes on **Design of Controlled Release Systems** **10 marks**
- 3- **Diffusion-Controlled Controlled Release systems** **10 marks**
- 4- **write the chemical structure of Gutta-percha rubber** **10 marks**
- 5- **Classification of hydrogel** **10 marks**
- 6- **Chemical cross-linking as a Methods to produce hydrogel** **10 marks**
- 7- **The application of hydrogels for drug delivery** **10 marks**
- 8- **Ageing Agents as polymer additives** **10 marks**
- 9- **Two methods to produce hydrogel** **10 marks**
- 10- **Put the sign (√) on the correct statement and the sign (X) on the incorrect statement** **10 marks**
 - a- Hydrogels are hydrophilic polymers that absorb water and are soluble in water at physiologic temperature ()
 - b- Poly vinyl alcohol can be produced from poly vinyl acetate ()
 - c- Smoke Suppressants is to increase smoke evolution ()
 - d- Light stabilizers are effective as antioxidants at low and moderate temperature ()
 - e- Drugs can also be cannot covalently conjugated to the hydrogel matrix ()

EXAMINERS	Professor El-Refaie Kenawy	



TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

EXAMINATION FOR FORTH YEAR MATERIALS SCIENCE

COURSE TITLE: MICROCONTROLLERS AND MICROPROCESSORS MS 4254

DATE: 23- 5- 2015

MARKS:

100

TIME 2 HOURS

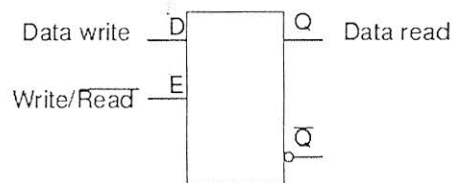
Answer all the following questions:

1- State the different applications of Shift registers and discuss in some details only two of these applications. (25 Marks)

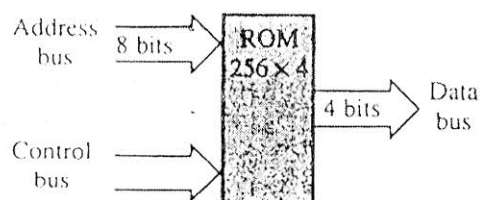
2- Draw a block diagram for a **1 K –Byte** memory showing all possible input and outputs details ,and discuss briefly the use of both **Static** and **Dynamic** memories in computers (15 Marks)

Then answer only one of the following:


(A) Using the following one bit memory block diagram show how the **Tristate** buffer is used to connect the data write (D) and data read (Q) can be connected to the same data line bus(in/out) (10 Marks)



(B) Using the following block diagram of a memory of 256x4 bits ,show how this can be used for the two types of memory expansion (10 Marks)



Turn the Page

	TANTA UNIVERSITY- Faculty of Science -Department of physics			
	EXAMINATION FOR LEVEL 4 STUDENTS OF MATERIALS SCIENCE			
	COURSE TITLE:	Materials in Electronics		COURSE CODE: MS4244
DATE:	6 JUNE 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

ANSWER THE FOLLOWING QUESTIONS:

First Question:

- 1- Write the most important notes about the materials which are used for printed electronics and substrates. (15 Marks)
- 2- Compare between vapor-phase epitaxy and molecular beam epitaxy. (10 Marks)

Second Question:

- 1- Give examples of elemental semiconductors and compound semiconductors and some of their applications. (10 Marks)
- 2- Illustrate briefly Czochralski method and particularly liquid-encapsulated Czochralski method. (15 Marks)

Third Question:

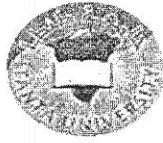
- 1- What is the origin of magnetic properties in different materials? (5 Marks)
1. Write short points about :
 - a- Plank's theory of black body radiation.
 - b- De Broglie assumption.
 - c- Shrödinger wave equation.
 - d- The most important postulates (I, II and III) of quantum mechanics. (20 Marks)

Fourth Question:

- 1- Choose the right statement from between the brackets: (16 Marks)
 - a- The diamond structure can be thought of as an fcc lattice with an extra atom placed at $(a/2+b/2+c/2 - a/4+ b/4+c/4)$ from each of the fcc atoms.
 - b- In composites, the individual components (**completely interact - remain separate and distinct**) within the finished structure.
 - c- The chemical formula for perovskite compounds is ABX_3 , where 'A' and 'B' are two (**anions - cations**) of very different sizes, and X is the (**cation- anion**) that bonds to both.
 - d- Off-centering of an undersized B ion within its (**tetrahedron - octahedron**) can occur and allows it to attain a stable bonding pattern and the resulting electric dipole is responsible for the property of (**ferroelectricity - ferromagnetism**) shown by some perovskites.
 - e- Soft ferrites have (**low -high**) coercivity whereas hard ferrites have (**low - high**) coercivity.
- 2- Define: (9 Marks)
 1. Magnetoresistance
 2. Giant magnetoresistance (GMR)
 3. Colossal magnetoresistance (CMR).

☺ ☺ BEST WISHES ☺ ☺

EXAMINERS	PROF. DR. S. A. SAAFAN
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Tanta University
Faculty of science
Physics department

امتحان الفرقة الرابعة

فى الفيزياء

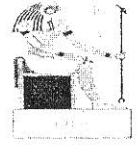
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رقم المقرر

٢٠١٥ / ٦ / ١٠

تاريخ الامتحان

زمن الامتحان: ساعتان



جامعة طنطا
كلية العلوم
قسم الفيزياء

Answer the following questions:

1- "Nuclear analytical techniques still suitable for study samples in all fields of life", discuss.

2-a Classify the nuclear detectors and mention the properties required for a semiconductor detector material.

2-b What are the applications of Mossbauer spectroscopy?

3-a Write down the method of analysis based on Rutherford backscattering spectroscopy.

3-b **Define:** Neutron activation analysis, Mossbauer spectroscopy, thermal and fast neutrons, NIM - Nuclear Instrumentation Module, Discriminators.

3-a True or false:

- 1- RBS is the most frequently used ion beam analysis method. It relies on the fact that the energy of an elastically backscattered particle depends on the mass of the target atom (kinematic factor) and on the depth at which the scattering took place (energy loss on the way to and from the point of interaction).
- 2- Elastic Recoil Detection Analysis is used for Light elements detectable on heavy substrates

3-b discuss in details neutron activation analysis technique.

4-a Elastic and inelastic scattering of MeV ions with target nuclei can be used to identify the elemental composition of the target. The depth scale of the compositional profile is provided by the energy loss of the ions in the material. Elastic Recoil Detection Analysis is one tool that has been used for this purpose, how?

4-b Atomic absorption/emission spectrometry has a specific role in atomic analytical techniques, discuss in brief this technique.

WITH MY BEST WISHES

Tanta University
Faculty of Science
Department of Physics

Final First Term Examination
Academic year 2014/2015
Thin Films Course

Course Code: MS 4234
Material Science
Date: 27/5/2015
Time allowed: 2 hours



Solve the Following Questions:

First Question :(25 marks)

- (a) What are the types of defects and impurities in solids generally and in thin films particularly?
Explain in details.
- (b) Compare explicitly between the thermal evaporation and sputtering techniques of thin film deposition.

Second Question :(25 marks)

- (a) To describe the geometric arrangement of the lattice points and hence, the crystal structure we should use many concepts. From which, discuss the Bravais lattices, point groups, space groups and grain boundaries.
- (b) Explain the basics of the chemical bath deposition technique. What are the factors governing this process.


Third Question :(25 marks)

- (a) Thin film growth process includes many different steps. Explain these steps briefly?
 - (b) Explain the important techniques used in determine the electrical properties of the thin films (cross resistivity – surface resistivity – material type).

Fourth Question :(25 marks)

- (a) What are the types of the vacuum pumps? Explain in details the rotary vane pumps and the oil diffusion pumps.
- (b) Mention and explain two methods of thickness measurements of thin films.


With my best wishes.

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY		
	EXAMINATION for Seniors students (Fourth Year) students of Material science		
	COURSE TITLE:	Applied Polymer Chemistry تطبيقات البوليمرات	COURSE CODE: CH4222
DATE:	MAY 25 TH 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100 TIME ALLOWED: 2 HOURS

Answer the following questions:

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EXAMINERS	Professor El-Refaie Kenawy	
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	TANTA UNIVERSITY			
	FACULTY OF SCIENCE			
	DEPARTMENT OF PHYSICS			
	EXAMINATION OF ANALYSIS TECHNIQUES IN MATERIALS SCIENCE FOURTH LEVEL			
STUDENTS OF (MATERIALS SCIENCE) طلاب علوم المواد				
COURSE TITLE:		ANALYSIS TECHNIQUES IN MATERIALS SCIENCE		CORSE CODE: MS4222
DATE:16	JUNE 2015	TERM: 2ND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HR

Answer The Following:

First question: {30 Marks}

- a) Discuss the following:
- 1) X-ray fluoresces. 2) X-ray safety. (15 Marks)
- b) Compare between different types of x-ray analysis techniques. (15 Marks)

Second question: {25 Marks}

Write short notes on:

- a) Indexing of powder diffraction.
- b) Lattice parameters determination.

Third question: {25 Marks}

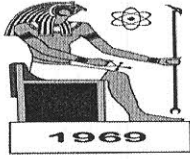
Write short notes on:

- a) IR spectroscopy.. (12 Mark)
- b) Raman spectroscopy. (13 Mark)


Fourth question: {20 Marks}

Discuss the activation analysis technique, showing its advantages and disadvantages.

Examiners	Prof. Talaat M. Meaz	Prof. Mostafa K. El-Nimr
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قسم الفيزياء
الفصل الدراسي الثاني ٢٠١٤ - ٢٠١٥

	TANTA UNIVERSITY- Faculty of Science -Department of Physics			
	EXAM FOR LEVEL FOUR STUDENTS OF GENERAL PHYSICS			
	COURSE TITLE	MATERIAL SCIENCE (2)		COURSE CODE: PH4193
DATE:	18- 6 - 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

First Question:

- 1- Cite and describe the mechanism of one application of advanced ceramics.
- 2- Briefly explain Energy band structure of solid. [25Markes]

Second Question:

- 1- Write structure of ethylene gas; explain the transformation of Ethylene gas into Polyethylene (solid) using catalyst (R). Describe Polyethylene structure.
- 2- Briefly describe the phenomena of Ferroelectricity and Piezoelectricity. [25Markes]

Third Question:

- 1- Distinct between:
 - (a) Semiconductor and insulator.
 - (b) Conductivity in intrinsic and extrinsic semiconductors.
 - (c) Thermal conductivity and heat capacity in solids. [20Markes]


Fourth Question:

- 1- Define;
 - (a) Hall Effect, (b) Phonon, (c) n-type semiconductor,
 - (d) Hole, (f) Thermal Extension, (e) Thermal Stress.
- 2- The electrical conductivity and electron mobility for aluminum are $3 \times 10^7 (\Omega.cm)^{-1}$ and $0.0012 m^2/V-s$, respectively. Calculate the Hall voltage for an aluminum specimen that is 15 mm thick for a current of 25 A and a magnetic field of 0.6 tesla (imposed in a direction perpendicular to the current). [30Markes]

EXAMINER	DR. REDA EL-SHATER
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☺ BEST WISHES ☺

فريق

	TANTA UNIVERSITY			
	FACULTY OF SCIENCES			
	DEPARTMENT OF PHYSICS			
EXAMINER:		PROF. DR. RAYAD A.M. GHAZY		
COURSE TITLE:	molecular physics		CODE: PH4244	
DATE:	06/06 /2015	2 ND TERM	TOTAL MARKS: 200	PERIOD: 2 HOURS

Answer the following questions :-

1-Measurements of the far- infrared absorption bands of the HCl molecule allow direct access to the pure rotational transitions. Some of the obtained results are as follows:

$\Delta E = 83.32 \text{ cm}^{-1}$ for the $J=3 \rightarrow J=4$ transition;

$\Delta E = 104.13 \text{ cm}^{-1}$ for the $J=4 \rightarrow J=5$ transition;

$\Delta E = 104.13 \text{ cm}^{-1}$ for the $J=5 \rightarrow J=6$ transition.

- Verify the consistency of the measurements and obtain the rotational constant B for the HCl molecule;
- Calculate the internuclear distance of the chlorine atom $m_{Cl} = 35.5 m_u$ where $m_u = 1.67 \times 10^{-27} \text{ kg}$; and
- Explain the obtained result for the rotational constant B.

b: Drive a relation by which you can determine the energy of the harmonic oscillator model of a diatomic molecule?

2-a: Derive an equation to give the quantum number J of the most heavily populated rotational level of a given vibrational level. From this expression calculate the most heavily populated rotational level of the ICl molecule ($B = 0.114 \text{ cm}^{-1}$) at room temperature?

b: The observed vibrational frequency of iodine (I_2) molecule is $\omega_e = 213 \text{ cm}^{-1}$. Knowing the mass of each iodine atom ($m = 21.08 \times 10^{-26} \text{ kg}$), calculate the elastic constant of the molecule?

3-a: Mention two different molecular models and explain how you can use one of them to explain the pure rotational molecular spectra?

b: Drive and show how the real molecule behave similarly to the predictions of the harmonic model for small values of the vibrational quantum number, v?


4-a: Explain how one of molecules has at least two symmetry elements; giving an example?

b: Discuss the energy levels involved in a heteronuclear diatomic molecules through its observed vibration- rotation spectra showing the concept of the null gap and explain the molecular first overtone phenomena?

S. Ghazy

EnD

فيزياء

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS		
	EXAMINATION OF 4 TH YEAR PHYSICS STUDENTS		
COURSE TITLE:	High Energy Physics	COURSE CODE: PH 4234	
3/6/2015	TERM: SECOND	TOTAL ASSESSMENT MARKS:100	TIME ALLOWED: 2 HOURS

Answer the following questions:

First question:- (25 Marks)

1. It is proposed to use the LHC to collide 7 TeV protons with 50 GeV electrons, in the so-called LHC. Calculate the center of mass energy of this system.
2. Explain what is meant by the terms weak charged current and weak neutral current and draw the lowest order Feynman diagrams to illustrate one example of each.

Second question: - (25 Marks)

1. Put true or false and correct the false ones:
 - a) Cross section is measured in terms of barns.
 - b) qq or qqqq combinations are observed.
 - c) Strongly decaying particles have very short lifetimes and hence large widths
 - d) Leptons come in 3'colors.
 - e) Leptons - have electric charge 0 or $\pm e$
2. Write down the quark content of the following particles:

$$\Lambda^0 - \Pi^+ - \Delta^0 - p - K^0$$

Third question:- (25 Marks)


1. Give the symbol, charge and approximate mass for the five carrier particles of the electromagnetic, weak and strong forces.
2. Two protons are separated by a distance of 10^{-15} m. Calculate:
 - (a) the electric force and (b) the gravitational force on one proton due to the other. Using the relative strengths of the strong, electromagnetic, weak and gravitational forces, estimate
 - (c) the strong force and (d) the weak force between the two protons.
 - (e) Summarize the four results in order of increasing strength.

$$(K=9 \times 10^9 \text{ Nm}^2\text{C}^{-2}), q= 1.6 \times 10^{-19} \text{ C}, G= 6.67 \times 10^{-11} \text{ Nm}^2\text{Kg}^{-2} \text{ and } m=1.67 \times 10^{-27} \text{ Kg})$$

Fourth question:- (25 Marks)

1. Compare between proton and electron colliding beam machines.
2. Define the terms baryon and meson with examples.

(Best wishes ----- Dr. Yasser Abdou)

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS		
	EXAMINATION OF 4 TH YEAR PHYSICS STUDENTS		
COURSE TITLE:	ASTROPHYSICS II	COURSE CODE: PH 4204	
1/6/2015	TERM: SECOND	TOTAL ASSESSMENT MARKS:100	TIME ALLOWED: 2 HOURS

Answer the following questions:

First question:- (25 Marks)

a- Define: Solar constant – Luminosity - The spectroscopic parallax - Neutron Star – Solar wind.

b- Count the layers of the Sun and explain the process which releases energy that powers the Sun.

Second question: - (25 Marks)

a-Explain briefly the formation of stars like the sun.

b-Put true or false and correct the false ones:

1. The equatorial rotation period at the equator is about 55 days.
2. The average number of sun spots reaches a maximum every 11.
3. The pulsar in the core of the Crab Nebula blinks on and off 60 times a second.
4. Clocks near the black hole appear to slow down to an external observer
5. The interstellar medium is the region out of which new stars are born

Third question:- (25 Marks)

a-What is the solar magnetism and how the combination of differential rotation and convection radically affects the character of the Sun's magnetic field.

b- Discuss how black holes are considered as a cosmic heater.

Fourth question:- (25Marks)

a-What is Nebulae? Compare between different kind of Nebulae?


b-Choose from between the brackets:

1. The stars called Red Giants are much (larger - smaller) than the Sun.
2. The spectral sequence from M to O is a sequence of (increasing temperature - decreasing age - decreasing mass - decreasing temperature - decreasing ionization).
3. If we compare two stars of different temperature, the hotter star emits (more – less) energy from each unit area of surface.
4. According to the spectral classification, the Sun is (O2 – G2 - M2).
5. Massive stars burn up (fastest - slowest) and have (longest - shortest) lives.

(Best wishes ----- Dr. Yasser Abdou)

فريق

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS		
	EXAMINATION OF 4 TH YEAR PHYSICS STUDENTS		
COURSE TITLE:	ASTROPHYSICS II		COURSE CODE: PH 4204
1/6/2015	TERM: SECOND	TOTAL ASSESSMENT MARKS:100	TIME ALLOWED: 2 HOURS

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(Best wishes ----- Dr. Yasser Abdou)



فيزياء

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

EXAMINATION FOR FOURTH YEAR

COURSE TITLE:	Applications of laser physics		COURSE CODE: PH4224
DATE:	13/6/2015	TERM:SECOND	TOTAL ASSESSMENT MARKS: 50
		TIME ALLOWED: 2 HOURS	

ANSWER ALL QUESTIONS:

- 1-Explain the construction and working of semiconductor laser.
- 2- What are the fundamental characteristics of laser diode. How it different from ordinary diode.
- 3-a) What is optical fiber communications, why use it .
b) Write on the laser cutting system .
- 4-Discuss in details the application of laser in medicine .

Good luck



TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

EXAMINATION FOR FOURTH YEAR

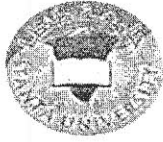
COURSE TITLE:	Applications of laser physics		COURSE CODE: PH4224
DATE:	13/6/2015	TERM:SECOND	TOTAL ASSESSMENT MARKS: 50
			TIME ALLOWED: 2 HOURS

ANSWER ALL QUESTIONS:

- 1-Explain the construction and working of semiconductor laser.
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Good luck

مركز البحوث



Tanta University
Faculty of science
Physics department

امتحان الفرقة الرابعة

فى الفيزياء

PH 4264

رقم المقرر

٢٠١٥ / ٦ / ١٠

تاريخ الامتحان

زمن الامتحان: ساعتان



جامعة طنطا
كلية العلوم
قسم الفيزياء

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2-a Classify the nuclear detectors and mention the properties required for a semiconductor detector material.

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3-b Define: Neutron activation analysis, Mossbauer spectroscopy, thermal and fast neutrons, NIM - Nuclear Instrumentation Module, Discriminators.

3-a True or false:

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3-b discuss in details neutron activation analysis technique.

4-a Elastic and inelastic scattering of MeV ions with target nuclei can be used to identify the elemental composition of the target. The depth scale of the compositional profile is provided by the energy loss of the ions in the material. Elastic Recoil Detection Analysis is one tool that has been used for this purpose, how?

4-b Atomic absorption/emission spectrometry has a specific role in atomic analytical techniques, discuss in brief this technique.

WITH MY BEST WISHES

فريق



TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

EXAMINATION FOR FRESHMEN (FOURTH YEAR) STUDENTS OF PHYSICS

COURSE TITLE:	امتحان فيزياء البلازما لشعبة الفيزياء الخاصة مستجدون	COURSE CODE:PH 4274
DATE:	27/5/2015	TERM: SECOND
	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED 2 HOURS

Answer the Following Questions:

First question:

a) Complete:

(17 marks)

1. The flow of ions through the plasma sheath is controlled by.....
2. A plasma can be defined as a quasi-neutral gas of charged and neutral particles characterized by a
3. Taking into account the wide ranges of parameters, the plasmas are classified into several categories.....,.....,.....
4. The parameter that defines the density of charged particles in the plasma is the.....
5. The response of charged particles to reduce the effect of local electric fields is called.....
6. The.....is the electrical potential developed across the plasma sheath, its value is given for a planar surface by.....
7. The thickness of the plasma sheath is defined as.....
8. The ion current density through the plasma sheath J is given by the equation.....which is called.....Law.
9. To sustain a plasma in a gas, three conditions that have to be satisfied are given by.....,.....,.....
10. Capacitively coupled rf discharges exist in two forms which are.....,.....

- b) Calculate the sheath potential at a spherical surface in contact with helium plasma sustained at a low pressure having an electron temperature of 1 eV. What is the thickness of the plasma sheath if the plasma potential is 20 V. (8 marks)

$$(m_e = 9.11 \times 10^{-31} \text{ Kg}, k = 1.38 \times 10^{-23} \text{ JK}^{-1}, V_B = -100 \text{ V}, e = 1.6 \times 10^{-19} \text{ C}, \lambda_D = 74 \mu\text{m})$$

Second question:

Derive that $\lambda_D = \left(\frac{\epsilon_0 k T_e}{n_e e^2} \right)^{1/2}$. (25 marks)

Third equation:


- a) Write the advantage of the pulsed dc discharge over the continuous dc discharge. (9 marks)
- b) Compare between the capacitive coupled discharge and the inductively coupled discharge. (16 Marks)

Fourth equation:

Discuss the diffusion of charged particles in plasma in details. (25Marks)

EXAMINER	DR. SHROUK FATHY ELASHRY
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☺ ☺ ☺ Best Wishes ☺ ☺ ☺

	TANTA UNIVERSITY- Faculty of Science -Department of Physics			
	EXAM FOR SENIORS STUDENTS OF PHYSICS			
	COURSE TITLE:	Condensed Matter Physics		COURSE CODE: PII4214
DATE:	23 MAY 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions:

First Question

(25 Marks)

- A- Explain with the aid of the magnetic splitting of the ground state multiplet and the first excited multiplet, why the behavior of rare earth trialuminides $TmAl_3$ agrees with Curie's law whereas $SmAl_3$ behaviour doesn't agree with it?
- B- Represent in the form of structural units : the elemental selenium, the binary compound As Se, and the ternary compound $TlAsSe_2$.

Second Question

(25 Marks)

- A- If there are Z magnetic nearest neighbor atoms surrounding a given magnetic atom, one has $H_{exch} = -2 Z J_m \bar{S} \cdot \langle \bar{S} \rangle$, prove that the molecular field $H_m = N_W \bar{M}$.
- B- Write short notes about: amorphous and glassy state.

Third Question

(25 Marks)

- A- How to describe the magnetization of ferromagnetic material below its Curie temperature, starting with the equation: $\bar{M}(T) = \bar{M}(0) B_J(y)$?; i.e. (Find a relation which expresses the variation of the reduced magnetization with the reduced temperature, and which depends exclusively on the form of $B_J(y)$ function).
- B- Write short notes about: ferromagnetic amorphous alloys (TM-M).

Fourth Question

(25 Marks)

- A- Write briefly about the glass formation region in one ternary system of $P-Se_{2.5(4)}-Te(Tl)$ systems, and give very short comments about the change character of each of the density, T_g , electric conductivity, electric conduction activation energy, and the paramagnetic component of the susceptibility, due to introducing Te or Tl into the binary P-Se system.
- B- Draw a schematic diagram of the field dependence of the total magnetization in an antiferromagnetic single crystal in which the magneto crystalline anisotropy is :
1- relatively low 2- very strong; when measurements are made with the field applied both in the hard direction and in the easy direction. Also, name the two phenomena that will occur at the critical field in the two cases mentioned above.

EXAMINER	PROF. HASSANEIN ELLABANY
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☺ BEST WISHES ☺

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