

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

General Physics & Material Science: (LEVELFOUR)

COURSE TITLE:

Detectors & Accelerators

COURSE CODE: PH4163

TOTAL MARKS 100

SEMESTER: ONE

TIME ALLOWED: TWO HOURS

DATE: 27/12/2016

Q1: Put (√) or (X) then correct and rewrite the wrong sentences

[15 Marks]

- a- Good spectrometer should has high resolution and transmission ()
 b- Geiger Muller counter operates at relatively high voltage ()
 c- Ge(Li) detectors are more suitable than silicon detector for the detection of electromagnetic radiation ()
 d- Pair production cross section is proportional to Z^4 of the absorber ()
 e- One advantage of linear accelerators is that they emit synchrotron radiation ()

Q2:

[23 Marks]

A- Compare between transverse and longitudinal Beta-particles magnetic spectrometer, support your answer (with necessary figures and mathematical equations) (16 Marks)

B- 1 cm thick lead absorber attenuated an initial 10 MeV neutron beam to 84.5% of its value, what is total cross-section? given that the atomic weight of Pb = 207.21 and its density is 11.3 gm/cm³? (7 Marks)

Q3: Complete the following sentences

[42 Marks, 1.5 mark for each space]

1- Slow neutrons are classified into:

a- b- c- d- e-

2- The different methods used in neutron detections are:

a- b- c- d-

3- Examples of solid state detectors are:

a- b- c-

4- Examples of gas filled detectors are:

a- b- c-

5- Application of linear accelerators are:

a- b- c-

6- The advantages of circular accelerator over linear accelerator are:

a- b-

7- A linear particle accelerator consists of the following elements:

a- b- c-
 d- e- f-

8- The disadvantages of circular accelerator are:

a- b-

Q4:

[20 Marks]

A- Draw and explain the construction and basic principle of operation for diffused junction detector (10 Marks)

B- Explain the Recoil proton method "support your answer with necessary figures and equations" (10 Marks)

Examiner

Prof. Dr. Mohsen Elkhsht

Dr. Sherief Hamada.



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Tanta University – Faculty of science

Physics Department – Final Exam – Jan.2016/2017

PH4105 for 4th year – Time : 2h

I-Write the scientific name of the following: (30 marks)

- 1-When, due to the incident radiation, electrons in the outer shell are raised by one energy level, the phenomenon is known as (.....)
- 2-It is a functional group not conjugate with other group which exhibits a characteristic absorption spectrum in UV/V region. (.....)
- 3- Many molecules have the ability to rotate the plane of polarization of plane-polarized light. This property is called (.....)
- 4- For wet specimens the process which has to be carried out gradually in order that the sudden loss of water does not distort the structure, this process is called (.....)
- 5- The one types of microscopy in which a dark image against a brighter background is produces. (.....)
- 6-The compound which absorbs the blue light and emits the green light is called. (.....)
- 7-It is a method used to prepare samples when only the surface features are of interest. (.....)
- 8-The process to increase the contrast between the sample and the background, the specimen has to be stained with a heavy metal, is called. (.....)
- 9- It is a phenomenon by which certain substances absorbs light with particular wavelength after a very short time the light is re-emitted with its wavelength altered. (.....)

a-do not exhibit.

b- exhibit.

c-sometimes exhibit.

d-often exhibit

6-ESR phenomenon is showed by

a-atoms having an odd number of electrons

b- atoms having an even number of electrons

c-nuclei having even number of proton

d-none of the obove

7-The magnetic moment of unpaired electron is about.....times that of proton.

a- 7

b- 70

c-7000

d- 700

8-When the object is at a point exactly twice the focal length of a convex lens the image is

a-at infinity

b-real, inverted and minified

c- real, inverted and magnified

d- real, inverted and same size

9- If light is composed of two plane waves of differing amplitude are related in phase by $\lambda/4$ or other than $(\lambda/2, 3\lambda/4, \dots)$, then the light is said to be

a- elliptic polarized light

b- plane polarized light

c- circular polarized light

d- no one of the above

10-Microwaves are used to study

a-small angle scattering of molecules.

b-only rotational spectra of molecules.

c-electronic structure of molecules.

d- only vibrational spectra of molecules.

11-Transition between electronic energy levels are found in.....regions.

a-UV/V

b-IR only

19-In TEM the specimen is placed in high.....

a-pressure

b-temperature

c-vacuum

d-none of the above

20-Inthe electron beam after passing through the condenser lens is deflected in a raster pattern over the specimen stage.

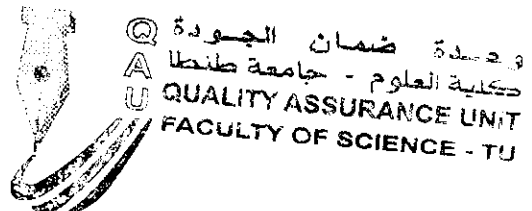
a-optical light microscope

b-tunneling electron microscope


c-transmission electron microscope

d-scanning electron microscope

III-Draw a schematic diagram of the compound microscope. (10 marks)



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	TANTA UNIVERSITY- Faculty of Science -Department of Physics			
	EXAM FOR SENIORS STUDENTS OF GENERAL PHYSICS			
COURSE TITLE	Materials Science		COURSE CODE:PH4193	
DATE:	17- 1 - 2017	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Hint: Illustrate your answer by schematic diagram as possible.

First Question:

1. Cite three criteria that are important in the materials selection process. [10marks]
2. Briefly describe covalent and metallic bonds. [10marks]

Second Question:

1. State and explain Brag's law to determine the interplanar spacing for crystal structures that has cubic symmetry. [10marks]
2. Name two types of Impurity point defects are found in solid.
Provide a brief written about the factors affect these defects (*Impurity point defects*) in solid, and finally Given examples of these defects. [20marks]

Third Question:

1. Sketch/describe unit cells for sodium chloride and zinc blende. [10marks]
2. Briefly write short notes about the structure and properties of Graphite. [10marks]


Fourth Question:

1. List the Imperfection types in ceramics. [10marks]
2. Briefly explain: [20marks]
 - Diffusion in Ionic materials.
 - Plastic deformation in crystalline and non-crystalline ceramics.

<i>EXAMINER</i>	<i>DR. REDA EL-SHATER</i>
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☺ *BEST WISHES* ☺

بسم الله الرحمن الرحيم

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS			
	EXAMINATION FOR SENIORS (FOURTH YEAR) STUDENTS OF BIOPHYSICS			
	COURSE TITLE:	Environmental biophysics I		COURSE CODE:4178
DATE: 15	JANUARY., 2017	TERM: FIRST	FINAL EXAM. MARKS: 100	TIME ALLOWED: 3 HOURS.

(Answer the following question)

Q1

Discuss the problem of water pollution? (20)

Q2

Write what you know about the problem of air pollution? (20)

Q3

What do know about Pollution at home? (20)

Q4

(20)

(I) What are the applicable principles for the protection of the environment from radioactive contamination?

(II)

A. What is discharges?

B. What do we mean by radioactive waste?


(III)

A. What is Clearance?

B. Gave a simple idea on Potential sources of discharges to the environment associated to the Nuclear Power Generation

Q5

Why should we care about aerosol? (20)

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS				
	EXAMINATION FOR SENIORS (FOURTH YEAR) STUDENTS OF BIOPHYSICS				
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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS		
	FINAL EXAMINATION OF 4 TH YEAR PHYSICS STUDENTS		
COURSE TITLE:	Astronomy I		COURSE CODE: PH 4103
21/1/2017	TERM: FIRST	TOTAL ASSESSMENT MARKS:100	TIME ALLOWED: 2 HOURS

Answer the following questions:

First question;- (20 Marks)

-Put true or false and correct the false one(s):

1. Mars has strong magnetic field.
2. Mercury is slow and retrograde.
3. Earth's core temperature is not comparable to the surface temperature of the Sun.
4. Earth's magnetic field is the result of our planet's large, permanently magnetized iron core.
5. Mercury probably cooled and solidified faster than Mars because it is smaller.
6. Jupiter emits more energy than it receives from the Sun
7. Ganymede is the largest moon in the solar system.
8. Trojan asteroids orbit at Saturn's orbit.
9. Human can breath on Mars.
10. Moon and Mercury have wide variations in surface temperature

Second question: - (20 Marks)

Fill in the spaces

1. The Kuiper belt exists outside the orbit of -----.
2. ----- produces tides in Earth's oceans.
3. Comets from the ----- cloud wander into the inner solar system.
4. Moon has large dark flat areas, due to lava flow, called -----.
5. ----- has the biggest number of moons.
6. Earth's ----- protect us from the harsh realities of interplanetary space.
7. Europa is one of the ----- largest moons.
8. Saturn largest moon is -----.
9. ----- has largest volcano in solar system.
10. ----- are the bright flashes of light from micrometeoroids hitting the atmosphere.

Third question:- (30 Marks)

1. Give a brief description of Jupiter's Magnetosphere. **(15 Marks)**
2. What are the differences and similarities between jovian planets? **(15 Marks)**

Fourth question:- (30 Marks)

1. What is the greenhouse effect, and what effect does it have on Earth's surface temperature? **(15 Marks)**
2. a- Give short note about comets; support your answer with drawing. **(15 Marks)**

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