



كلية العلوم



Tanta University - Faculty of Science - Chemistry Department
 Final Exam of "Instrumental 2"
 For Third Level students (Material Science Section)
 Course Code: CH 3119 - Total assessment marks: 100
 Date: 4/1/2017 - Time Allowed: 2h

Answer the following Questions

1) Answer the following: (24 marks)

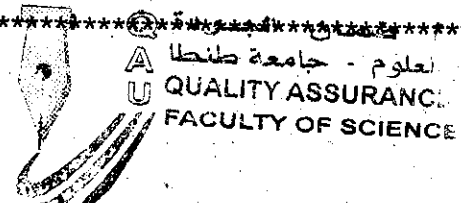
- A) Define; draw the schematics diagram of component, advantages and disadvantages of HPLC.
- B) What are the acceptable properties of moving and stationary phases used in Ion exchange and gel chromatography? And what properties of the molecule do they use to separate different compounds from each other.

2) Compare between of the following (28 marks)

- A) Frontal and displacement development.
- B) Ascending and radial development techniques.
- C) Packed and capillary column.
- D) TLC and HPLC.

3) Discuss the following: (24 mark)

- A) Discuss in details the factors affecting the separation of components in a mixture using gas chromatography.
- B) The using of thin-layer chromatography in identification and quantitative estimation of components in a mixture.
- C) The applications of ion-exchange chromatography in analytical chemistry.



7. What is the typical internal diameter of fused silica capillary columns?

- a. 0.2-0.3 mm
- b. 0.3-0.5mm
- c. 0.5-1.0 mm
- d. 1.0-2.0 mm

8. Which of the statements is correct?

- a. Gas chromatography is used to analyze gases
- b. Gas chromatography is used to analyze solids
- c. Gas chromatography is used to analyze gases, solutions and solids
- d. All of the above

9. HPLC methods include:

- a. liquid/liquid (partition) chromatography.
- b. liquid/solid (adsorption) chromatography.
- c. ion exchange and size exclusion chromatography.
- d. all of the above.

10. What does the selectivity factor describe?

- a. The proportional difference in widths of two chromatographic peaks
- b. The maximum number of different species which a column can separate simultaneously
- c. The relative separation achieved between two species
- d. None of the above

11) Normal-phase liquid chromatography refers to


- a) The use of a nonpolar solvent as the eluent in HPLC.
- b) The use of a polar material as the stationary phase in a chromatographic column.
- c) The use of a nonpolar material as the stationary phase in a chromatographic column.

12) What is the function of the detector in HPLC?

- a. It detects disturbances in the current.
- b. It detects stray light.
- c. It detects the molecules coming out from the column.
- d. It detects leakage.

***** Good luck *****

Examiner: Prof. Dr. Ahmed Rehab, Prof. Ali AbuSeif.

		TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS	
		EXAMINATION FOR FRESHMEN (THIRD YEAR) STUDENTS OF PHYSICS & M.SCIENCE	
COURSE TITLE:		COMPUTATIONAL PHYSICS فيزياء حاسوبية	COURSE CODE: PH3181
TERM	11/1/2017	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100 TIME ALLOWED: 2 HOURS

Answer The Following Questions:

First Question:

(25 mark)

- Construct a flowchart to see if a number n is negative, positive, or zero and write the corresponding FORTRAN program.
- Draw a flowchart to calculate the value of the function F(x) which is defined as:

$$F(x) = \begin{cases} 4x^3 & \text{when } x \geq 0 \\ 3x + 7 & \text{when } x < 0 \end{cases}$$

Second Question:

(25 mark)

- Write short notes about unconditional and conditional transfer statements in FORTRAN language and state an example for each statement.
- Using **each** of LOGICAL IF and DO statements write a program to compute the values of the variable, a, which is given by the equation $a = 6b^3 + 3b + 5$. Knowing that the values of, b, is between -6 and 6 in increments of 0.2.

Third Question:

(25 mark)

- State the general form of the counted DO loop and write down its rules.
- Write a FORTRAN program to compute the following summations

$$sum1 = x_1 + x_2 + x_3 + \dots + x_n$$

$$sum2 = \sum_i^n \frac{1}{i^2 + 5}$$

- Write a program to calculate factorial N.

Fourth question:

(25 mark)

- By using MATHEMATICAL GO TO and formatted input and output write a Fortran program to calculate the value of the variable, Z, which is given by the following equation:

$$Z = \tan(XY) \quad \text{when} \quad A = 1$$


$$Z = X + 5Y \quad \text{when} \quad A = 2$$

$$Z = |X^2 + Y^2| \quad \text{when} \quad A = 3$$

- Using nested DO loop write a program to print out the values of the variable a, which is given by the formula $a = 6b^2 + 15c^3 + d^4$ for the values of, b, c and d between -8 and 8 in increment of 0.1.

EXAMINERS	PROF.DR. G.A.GABALLA	
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	TANTA UNIVERSITY- FACULTY OF SCIENCE -DEPARTMENT OF PHYSICS			
	EXAMINATION FOR THIRD LEVEL STUDENTS OF MATERIAL SCIENCE			
COURSE TITLE:	SOLID STATE PHYSICS 1		COURSE CODE :PH3161	
DATE:	26,JANUARY, 2017	TERM :FIRST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED :2 HOURS


ANSWER THE FOLLOWING QUESTIONS:

- 1) Write short notes on:
 - a) Crystal systems and fourteen Bravais lattices. (13 marks)
 - b) Diffraction of X-rays and deduce Bragg's law. (12 marks)
- 2) a) In a cubic unit cell draw the planes (111), (202), (132) and (100). Calculate the inter planer distances for these planers if $a=4.8\text{\AA}$. (12 marks)
b) Explain in details one type of x-ray photographs. (13 marks)
- 3) Discuss the inter atomic forces in solids and show that the formation of chemical bond requires that the repulsive forces be of shorter range than the attractive ones and write short notes on valence crystal. (25 marks)
- 4) Prove that:
 - a) The inter planer distance d of a given plane (hkl) for a rectangular unit cell is given by the equation:
$$d = \frac{1}{\sqrt{\frac{h^2}{a^2} + \frac{k^2}{b^2} + \frac{l^2}{c^2}}}$$
(12 marks)
 - b) The Fermi energy E_f in an intrinsic semiconductor lies half way between the top of the valence band and the bottom of the conduction band. (13 marks)

EXAMINERS	PROF .DR . ABD ELRAZIK ABDEEN
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BEST WISHES

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS			
	EXAMINATION FOR JUNIORS (THIRD YEAR) STUDENTS OF MATERIALS SCIENCE			
	COURSE TITLE:	Atomic and Molecular Spectroscopy		COURSE CODE: MSJ121
DATE:	21 JANUARY 2017	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions

First Question

(25 marks)

- A- Explain the Tomson's method for determining e/M of the electron. (20 marks)
- B- What are the factors that photoelectric current depends on? (5 marks)

Second Question

(25 marks)

Describe Dempster's mass spectrometer.

Third question

(25 marks)

Talk about the photomultiplier tube.

Forth question


(25 marks)

- A- Find the total energy of the atom by using Bohr Theory of hydrogen atom. (12.5 marks)
- B- Draw the curve that describes the variation of ionization current and voltage and explain it briefly. (12.5 marks)

Examiners	Prof Dr. Mohsen Barakat
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☺☺ Best Wishes ☺☺

 <p style="text-align: center;">TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS</p>			
General Physics & Material Science: (LEVELTHREE)			
COURSE TITLE:		Environmental Physics	
TOTAL MARKS 100		SEMESTER: ONE	TIME ALLOWED: TWO HOURS
			COURSE CODE: PH3191
			DATE: 14/1/2017

Q1: Put (√) or (X) and then correct the wrong sentences (18 Marks)

- a- parabolic trough is less efficient than power tower in generating electricity ()
- b- Magnetosphere is the coldest region in atmosphere ()
- c- Global solar radiation is the sum of diffused and direct solar radiation ()
- d- Neutrons and electrons are examples for indirect ionizing radiation ()
- e- The upper part of the Ionosphere contains ozone layer ()
- f- Photoelectric effect is dominant at high electron energies ()

Q2: Define the following terms:

Hot particles – Equivalent dose – Particle fluence – KERMA – CEMA- Collision stopping power – Radiative stopping power – Scintillation materials (24 Marks)

Q3: Complete the following sentences: (31 Marks)

- 1- Different types of high temperature solar collectors are
a-..... b-..... c-.....
- 2- The properties of a good dosimeter are:
a-..... b-..... c-..... d-..... e-.....
- 3- The formation and release of hot particles in environment is due to:
a-..... b-..... c-..... d-.....
- 4- The different layers of the atmosphere are:
a-..... b-..... c-..... d-..... e-.....
f-..... g-.....
- 5- The unit of effective dose is, the unit of exposure is
- 6- For small cavity size, we can apply and theories. While for intermediate cavity size, we can apply theory
- 7- The three different types for β-decay are:
a-..... b-..... c-.....
- 8- The different main methods for radioactive decay are:
a-..... b-..... c-..... d-.....

Q4: Answer the following questions briefly. (27 Marks)

- A- Compare between Bragg-Gray and Spencer-Attix cavity theories?
- B- Discuss green-house effect.
- C- Compare between BWR and LMBFR according to 1-function 2-basic principle of operation 3-construction (core, coolant, moderator, heat transfer medium)

Examiners

Prof. Dr. Ibrahim Bondouk
Dr. Sherief Hamada.



أطيب الأمنيات لكم بالنجاح والتفوق
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