Mansoura University Faculty of science Physics Department Course code: Enrg 101 14/5/2016	Second Semester 2015-2016	1st Level Petrochemical students Full mark: 60 Allowed time: 2 hours Course title : Introduction to Non-Conventional Energy Sources

FINAL EXAMINATION

Answer the Following questions

N0		Question	Marks
1	A	What is the different configuration which available for turbine designs, and lists the components of the wind power system?	12
	B	Derive a theoretical expression for the total power extracted from the wind.	
2	A	Explain the principles of the Tidal power generation, and how energy can be extracted from it.	12
	b	What are the advantages and disadvantages of Tidal power system?	
3	A	List the different criteria upon which energy can be classified.	12
	B	Explain the different types of polluting the atmosphere by usage of energies in industry which leads to environmental damage.	
4	A	What is meaning by Solar Energy. List the essential subsystems in Solar energy plant.	12
	B	What are the principles of the solar collectors operations? List its classifications, advantages and disadvantages, its construction, and the factors affecting the performance of this system.	
5	A	What is the basic elements of the photovoltaic system, and explain how it works to generate electricity.	12
	B	Illustrate how Band Theory classified the matter according to its electrical conduction.	
	C	Define Intrinsic and extrinsic semiconductors.	

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Mansoura University
Faculty of Science
Chemistry Department
Subject: **Chem. 122**
Course(s): Inorganic Chemistry

First Term
Frist Level - Petrochemicals
Date: **24/5/2016**
Time Allowed: 2 Hours
Full Mark: **60** Marks

1. **True or false (circulate the correct answer) then Give Reason: (20 marks)**

a. *T – F* CO act as a good oxidizing agent.

b. *T – F* Si has able to form chains more than C.

c. *T – F* The size of Na is greater than Na^+ **(^{11}Na)**.

d. *T – F* Lithium has low m.p. and B.p. than the other group (I) elements.

e. *T – F* The ionization energy of **^4Be** atom is more than **^5B** atom.

f. *T – F* Diamond conducts electricity but graphite non-conduct electricity.

g. *T – F* Thallium shows an increased tendency to form univalent compounds.

h. *T – F* Electronegativity increase down the group but decrease across period.

i. *T – F* Photosynthesis process is the mainly source of O_2 in the atmosphere.

j. *T – F* H_2SO_4 is prepared by Haber process.

k. *T – F* SO_2 has triangle structure with sp2.

l. *T – F* Boric acid is strong monobasic Lewis acid.

m. *T – F* Bi in $NaBiO_3$ is very strong oxidizing agent.

n. *T – F* The noble gases have high electronegativity & low ionization energy.

o. *T – F* Carbon monoxide is poisonous gas.

p. *T – F* Red phosphorus flammable and self-igniting upon contact with skin.

q. *T – F* Be^{+2} salts are acidic in pure water.

r. *T – F* SO_2 is prepared in presence of V_2O_5 as a catalyst.

s. *T – F* Cs^+ ions conduct electricity better than Li^+ ions in aqueous solution.

t. *T –F* SiO_2 sublime at -78 but CO_2 melted at 1600 °C.

P.T.O

2. A- **Describe** structure and nature of bonding of the following: **(10 marks)**

a. B_2H_6, atomic number: H=1, B=5

b. NH_3, atomic number: N=8, H=1

c. SO_3, atomic number: O=8, S=16

d. BF_3, atomic number: B=5, F=9

B- **Complete** the following equation: **(10 marks)**

a. $2Na + H_2$ (500 °C) → .....**(1)**.....

b. $Mg + HCl$→ .....**(2)**..... + ...**(3)**.....

c. $B_2H_6 + 6H_2O$ → .....**(4)**..... + ...**(5)**.....

d. $CO + Cl_2$ → .....**(6)**.....

e. $2NH_3 + 3CuO$, 400 °C → $N_2\uparrow$ + ...**(7)**..... + ...**(8)**.....

f. $2KIO_3 + HSO_3$ → .....**(9)**..... + $H_2O + 3H^+$ + ...**(10)**.....

3. **Complete** the following statement: **(20 marks)**

a. The paramagnetic is ....**(1)**.... while, the diamagnetic is ....**(2)**....

b. The heat result during the preparation of water is used in ....**(3)**.... and ....**(4)**.... of metals.

c. White phosphorus has ....**(5)**.... structure with ....**(6)**.... hybridization, while red phosphorus has ....**(7)**.... structure.

d. NH_3 is prepared by ....**(8)**.... process at pressure ....**(9)**.... Atmosphere and ....**(10)**.... temperature.

e. The electron affinity ....**(11)**.... down the group but, ...**(12)**.... across the period.

f. Hydrogen molecule exists in two different forms known as ....**(13)**.... and ....**(14)**.... phases which have the same ....**(15)**.... but differ in ....**(16)**....

g. Oxygen can be prepared from potassium chlorate in presence of ....**(17)**.... at temperature ....**(18)**....

h. HBr & HI cannot be prepared by heating ....**(19)**.... or ....**(20)**.... with conc. H_2SO_4.

Good luck

Dr. Rania R. Zaky

MansouraUniversity
Faculty of Science
Department of Geology

Final Exam: First year, Petrochemical (7/6/2016)
Course: Petroleum production processing (ك ب١٩٢)
Time: 2 hours

Answer the following questions:

Q1:

A- Complete: **(14 Marks)**

1- Formation density is .....proportional to organic matter content

2- There are three types of porosity, they are ....., ..., and .....

3- Petroleum system consists of ....., ..., ..., ..., and .....

4- Traps are described as ....., ... , and .....

5- The total organic matter content of the shale can be calculated either from .....or.....

B- True or False: **(8 Marks)**

a) If both $D_{(\rho b)}$ and $D_{(\Delta T)} > 0.0$, then the rock is considered as non-source rock ( ).

b) If both $D_{(\rho b)}$ and $D_{(\Delta T)} < 0.0$, then the rock is considered as source rock ( ).

c) If each $D_{(\rho b)}$ and $D_{(\Delta T)} > 0.0$, then the rock is undecided as source rock ( ).

d) If each $D_{(\rho b)}$ and $D_{(\Delta T)} < 0.0$, then the rock is undecided as source rock ( ).

Q2:

A- Define the following: Isopach contour map – Structure contour map- Hydrocarbon saturation contour map. **(12 Marks)**

B - 3)Illustrate how to calculate the following: 1) total organic matter content from gamma-ray log 2) total Organic Carbon Content (wt. %). **(10 Marks)**

Q3:

A- illustrate the main different types of geophysical methods for petroleum prospecting? **(10 Marks)**

B- What are the main objectives of Geophysics? **(6 Marks)**

Q4:

A-Write down with symbols Archie equation for calculating saturation? **(10Marks)**

B- Illustrate how to calculate porosity from Sonic and Density Logs? **(10Marks)**

Best Wishes:

لجنة التصحيح والمناقشة: د.عادل كامل د. أحمد شلبي

Mansoura University **Faculty of Science** **Physics Department** **Electricity, Magn. &Optics** **Phys.102.**		**2nd term 2015-2016** **1st year Petro-Chem.** **Students.** **Date: June. 2016** **Time allowed: 2hours**

Answer only Four questions from each class:

I-ELECTRICITY AND MAGNETISM

1-a) Define **Four** from the following: Ohm 's law, Gauss' law, electric dipole, magnetic dipole, magnetic flux and capacitors.

b) Write the units of the following quantities: Electric field, electric flux, capacitance , permittivity and conductivity. [8Marks]

2) Consider two identical charged particles, each of mass 0.02 Kgm hanging at a point by two equal strings of length 15 Cm. Calculate the magnitude of the charge if the equilibrium angle between the two strings is 10^0. [8Marks]

3-a) An insulating solid sphere of radius **R** has a uniform volume charge density ρ and carries a total positive charge Q. Using the Gauss law to determine the magnitude of the electric field at a point inside the sphere. [8Marks]

4) Consider a capacitor of two parallel plates, each of area A and separated by a distance d . Prove that its capacitance is given by $C= \varepsilon_0 A/d$, where ε_0 is the permittivity of its medium and calculate the energy stored in it. [8Marks]

5) A rectangular current loop of area 40 cm^2 consists of 20 turns of wire and carries a current of 20 mA placed in a uniform magnetic field of 0.5 T parallel to the plane of the loop , calculate the magnitudes of its magnetic dipole moment and the torque acting on loop. [8Marks]

II-OPTICS

1) Define **Four** from the following : Huygens's principle, refractive index , the total internal reflection , optical depth, and dispersion power. [7Marks]

2) Using the Huygens's principle to derive the Snell's law of refraction.[7Marks]

3) Describe the Pulfrich refractometer for measuring the refractive index of a solid sample. [7Marks]

4) An optical fiber may have a core of dense flint of refractive index $n_1=1.66$ and a coating of crown glass of refractive index $n_2=1.52$. Determine : Critical angle, Numerical aperture (N.A). [7Marks]

5) A prism that has an apex angle of 60^0 is made from a material its refractive index =1.8. What is its angle minimum deviation? [7Marks]

With best wishes

Prof. Dr. A.R.Degheidy **Prof. Dr. G.Damarawi**