المستوى الثانى - جيولوجيا - أحافير لا فقارية كبيرة ج ١١

Mansoura University
Faculty of Science
Geology Department
Course Title: Macrofossils (Invertebrate Paleontology)
Code: (G 201)
Full marks: 60

First Semester (January, 2014)
2rd level, Geology
Time: 2 hours
Date:28/12/2014

Answer the following questions

Question 1: Complete only the followings: (20 marks).

1- People fascinated with fossils because: 1.....2.....3..... .....
2- Fossil in dictionary refers to.....
3- Fossils include the three general types: 1.....2..... 3.....
4- The appearance of fossils will be dedicated by: 1.....2.....and.....
5- Fossilization process requires, at minimum..... of years to complete.
6- Major pre-burial processes affecting fossil preservation include: 1.....2.....3.....4.....5.....
7- The two important factors that promote the preservation of fossils are.....
8- The common mineral components of hard parts of fossils are: 1.....2.....3..... 4.....
9- Four main types of alteration of organic remains are 1.....2.....3.....4.....
10 - Petrification/permineralization occurs when.....
11- Carbonization refers to.....
12- The impression of the buried object made in the surrounding sediment is called.....,whereas the "steinkern" is the impression of the.....
13- Coprolites represents.....
14- The field of taphonomy is related to steps.....
15- The hierarchy of our species is.....Vertebrata, order....., genus.....and .....sapiens.
16- The geological applications of fossils include: 1.....2.....3.....4.....
17- Ontogeny is....., and phylogeny is.....
18- Only about 8,000 fossil species of ....., whereas three-quarters of millions of them are living species.

19- The fossil record is only is only..................of past life.

20- The goniatitic suture line has a deep narrow.......and a wide entire....................

Question 2: write short notes on fife only from the followings (20 marks):

1- Description of a single specimen.
2- Morphology and relationships of molluscan classes with reference to "hypothetical archimollusc".
3- -Sexual dimorphism in ammonites.
4- Shell morphology of *Nautilus* shell.
5- Shell shape and morphology of ammonites.
6- Suture lines of ammonites.
7- Shell of an extinct coleoids

Question 3 : Answer A and B: (20 marks)

A- Determine the right from the wrong, and correct the wrong (10 marks):

1- Hypothetical archimollusc has a rectangular-like shell.
2- The septum of ammonites marks the junction of a septum with the inner surface of the shell wall.
3- *Spiroceras, hamulina and macroscaphites* are among the representatives of hetermophic ammonoides.
4- The shell of Genus *Belemnites* has three parts namely: the Protoconch, the phragmocone and the body chamber.
5- The main difference between the gastropod and ammonoid shells having the same shape is the presence of septa in the former.
6- Taxodont dentition has 2 or 3 cardinal teeth below the umbo, as well as lateral teeth anterior and posterior to the cardinal teeth.
7- GONIATITIDA, CERATITIDA and AMMONITIDA are the important orders of the subclass HETERODONTA.
8- The two valves of class BIVALVIA are mainly named upper and lower valves.
9- The period late in geologic history are better represented, both geologically and paleontologically, than periods further back in time.
10- Fossil preservability is highly affected by biologic, mechanical and bilogical destructions.

B- Write an essay on the revision of the Theory of evolution from the paleontological point of view.(10 marks) هذا الجزء من السؤال بلغتنا العربية: أكتب مقالة عن مراجعة نظرية التطور العضوى فى ضوء بعض مشاهد علم الحياة القديمة، متضمنا الإجابة عن سؤال فحواه : هل أيدت الأحافير نظرية التطور المزعوم.

المصححون: أ. د حسنى حمدان* و أ. د. عبدالعزيز شاهين، أ.د. عمر حجاب، أ.د. محمود عابد

Mansoura University
Faculty of Science
Chemistry Department

First Term
Time Allowed: 2 Hours
Date: Jan. 2015
Full Marks : 60

Course(s): Chem.235 Principles of Organic Chemistry I for 2nd Level Microbiology, Chem. Bot., Chem. Zool., Geology, Biophysics and Environmental Science students

Answer All Questions

Q1: Complete the following equations **(20 Marks)**

a- $CH_3CH(Br)CH_2CH_3 \xrightarrow{Alc.KOH}$ -------

b- $CH_3CH_2COONa \xrightarrow{electrolysis}$ -------

c- $(CH_3)_2C{=}O \xrightarrow{PCl_5}$ -------

d- $CH_3C{\equiv}C{-}CH_3 \xrightarrow{O_3,\ Zn,\ H_2O}$ ------

e- $CH_3{\cdot}CH{=}CH{-}CHO \xrightarrow{NaBH_4}$ -------

f- $CH_3{\cdot}CH{=}CH{-}CH_3 \xrightarrow[aq.\ cold]{KMnO_4}$ -------

g- $CH_3C{\equiv}C{-}H \xrightarrow[H_2SO_4]{H_2O,\ HgSO_4}$ ------

h- $(CH_3)_2C{=}CH_2 \xrightarrow{Br_2,\ CCl_4}$ -------

i- $CH_3CH_2CH_2CH{=}O \xrightarrow{NH_2OH}$ -------

j- $C_6H_5CH_2OH \xrightarrow{PBr_3}$ -------

k- $CH_3C(Br)_2CH_3 \xrightarrow{Alc.KOH}$ -------

m- $CH_3CH(OH)CH_3 \xrightarrow[heat]{H_2SO_4}$ -------

n- $CH_3{-}C{\equiv}C{-}CH_3 \xrightarrow{H_2\ /\ Ni}$ ----- $\xrightarrow{HBr}$ -------

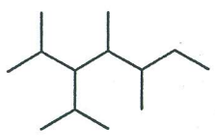
o- $C_6H_5{-}\overset{O}{\overset{\|}{C}}{-}CH_3 \xrightarrow{3\ I_2}$ ----- $\xrightarrow{NaOH,\ heat}$ -----

p- $C_2H_5C{\equiv}C{-}H \xrightarrow{amm.AgNO_3}$ ------ $\xrightarrow{CH_3Cl}$ ------

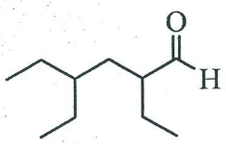
q- $(CH_3)_2\underset{Cl}{\underset{|}{C}}{-}CH(CH_3)_2 \xrightarrow{Alc.KOH}$ ------ $\xrightarrow[H_2O]{O_3,\ Zn(Hg)}$ ------

Q2: A) Give the IUPAC name for each compound. **(5 Marks)**

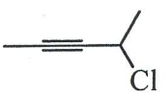
i -



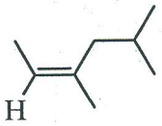
ii -



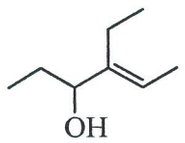
iii -



iv -



v -



b) Explain the followings by equations. **(15 Marks)**

i- Addition of HCl to 2-methyl-2-butene gives 2-chloro-2-methylbutane

ii- 2,3-dimethyl-2-butanol give mixture of two alkenes when heated with H_2SO_4

Please Turn to Next page

iii- Reaction of benzaldehyde with acetic anhydride in presence of CH_3COONa.

iv- Reaction of 2-methylpropene with Br_2 / H_2O

v- Treatment of acetaldehyde (2 moles) with 20% NaOH solution

A) Give product(s) of the following reactions, explain your answer with equations. (15 Marks)

i) Reaction of C_2H_5MgBr followed by H_2O with	**a)** CH_3CHO	**b)** HCHO
ii) Reaction of 50 % NaOH solution with	**a)** propanone	**b)** 2,2-dimethylpropanal
iii) Action of O_3, Zn(Hg), H_2O, on	**a)** 2-Butene	**b)** 1-butene
iv) Treatment of 2-bromopropane	**a)** Aq. NaOH	**b)** Alc. KOH
v) Action of $K_2Cr_2O_7$ / H_2SO_4 on	**a)** 2-butanol	**b)** 2-methyl-2-propanol
vi) Electrolysis of	**a)** $\begin{matrix}CH_2COOk\\ \vert \\ CH_2COOk\end{matrix}$	**b)** $\begin{matrix}CHCOOk\\ \Vert \\ CHCOOk\end{matrix}$

B) Compound **(A)** has molecular formula C_4H_8, when reacted with O_3 followed by hydrolysis gives a mixture of two products **(B)** and formaldehyde. Reduction of **(B)** give 2nd alcohol **(C).** When **(B)** reacts with methyl magnesium bromide (CH_3MgBr) followed by hydrolysis give product **(D).**

From these data, deduce the chemical structures of **A, B, C** and **D** with writing the chemical equations for the above reactions. **(5 Marks)**

With our Best Wishes

Examiners: Prof. Dr. Ahmed Fadda **Dr. Doria Saleh** **Dr. Manal El-fidawy**

Dr. Dalia Ayad **Dr. Noha Shaker**

Mansoura University Faculty of Science Chemistry Department Subject: Inorganic Chemistry CHEM 221 (s & p-Block elemnets)		First Semester 2nd Level Geology Students Date: 4th Jan. 2015 Time: 2 hours Marks: 80

Answer The Following Questions

I) Comment on (7 only) of the following:- **(28 marks)**

1) The reactivity of elements of **Group IA** with water increases down the group.

2) The 1st Ionization Energy (1st IE) of **($_{12}$Mg, $_{15}$P and $_{18}$Ar)** is high **while** for **($_{16}$S)** is low.

3) Berylium metal is amphoteric **whereas** aqueous solutions of Be(II) salts are acidic.

4) Boron trifluoride **(BF_3)** is Lewis acid.

5) The size of sodium ion **(Na^+)** is smaller than that of sodium atom **(Na), while** that of Cl^- is larger than **Cl**.

6) In aqueous solutions, cesium ions **(Cs^+)** conduct electricity more than **(Li^+)**, while the crystalline salts show decrease on the hydration.

7) Thallous (I); $_{81}Tl^+$ compounds are stable.

8) B_2O_3 shows amphoteric behaviour.

.....

II) A- Write shortly on (4 only) of the following:- **(20 marks)**

1) Separation of Aluminium metal **(Al)** from **bauxite ore {(AlO(OH)}**.

2) Plant fertilizers are normally containing **three main ingredients;** (Nitrogen, Phosphorous and Potassium).

3) The production of **nitric acid (HNO_3)** by **Oswald process**

4) Photodissociation of nitrogen dioxide **(NO_2)** and photochemical smog.

5) Isolation of pure silicon **(Si)** from **silica (SiO_2)**.

6) In aqueous solution, addition of **glycerol to $B(OH)_3$**, makes the later strong monobasic acid.

.....

II) B-Complete (6 only) the following chemical equations:- **(8 m**

1) $Ba + O_2$ (at 500 ^oC) $\rightarrow$

2) $CH_4 + H_2O$ (Ni, 1000 ^oC) $\rightarrow$

3) $CaC_2 + H_2O \rightarrow$

4) $Al_4C_3 + H_2O \rightarrow$

5) $KO_2 + H_2O \rightarrow$

6) $Ca(H_2PO_4)_2 + NaHCO_3$ (300 ^oC) $\rightarrow$

7) $P_4O_{10} + H_2SO_4 \rightarrow$

8) $NH_3 + CO_2 + NaCl + H_2O \rightarrow$

.....

III) Answer (3 only) of the following:- **(24 marks)**

1) **Give an account for ortho and para hydrogen**

.....

2) **Diamond and graphite** are **two allotropic forms** of carbon, **compare between these two forms**

.....

3) **Describe the structure and bonding of Diborane (B_2H_6)**

.....

4) **Explain how Silicon can be converted to semiconductors (n-type & p-type)**

Best wishes

Prof. Kamal Ahmed, Prof. Gabr Abou El Reash, Prof. Tawfik Rakha, Prof. Sahar Mostafa

Mansoura University
Faculty of Science
Geology Department
Date: 14-1-2015
Time : 2h

First Term Exam (January 2015)
Second Level (Geol. & geophys. Program)
Subject: G-203 (Petrology)
Total Marks: 60

Answer the following Questions:

Question One: Complete the following : **(20 marks)**

(1)..... is a good index to the maturity of sediments.

(2)Compacted and lithified sediments during burial are called .....

(3)Processes by which sediment particles laid down in beds called .....

(4)Physical and chemical changes that happened to sediments after deposition called .....

(5)Sediments with mud matrix, poor sorting and angular grains are described as.....

(6).....is a measure of the relation between the 3 dimensions of an object.

(7)..... and ..... describe spatial orientation and manner of arrangement of objects.

(8) Clay minerals such as .....,.....,.....,.....

(9) Heavy minerals such as .....,.....,.....,.....

(10)..... and .....are very important for occurrence of oil.

Question Two: Give a suitable name for these rocks: **(20 marks)**

(1) Terms used to describe transported and redeposited carbonate materials.
(2) Classification of conglomerates according to agent of fragmentation.
(3) Different types of arenites and wackes.
(4) Chemical precipitated silica.
(5) Non laminated lithified mud matrix containing angular to rounded polished rock particles.
(6) Fine grained rocks have sizes less than 1/16 mm (give three kinds).
(7) Pure chemical fresh water carbonate rocks.
(8) Accumulation of skeletal remains of bones and fossil shells.
(9) Biochemical carbonate rocks formed by constructive activity of organisms.
(10) Impure lime of calcium carbonate formed in arid region.

Question Three: Mentioned only : **(20 marks)**

1- Silicate minerals.
2- Minerals in the discontinuous reaction series.
3- Agents of metamorphism.
4-Metamorphic rocks show foliation, lineation and banding.
5- Textures distinguish igneous rocks.
6- Changes happened in the rock due to metamorphism.
7- Non-oriented metamorphic rocks.
8- Crystallization of igneous rocks from magma.
9- Dynamically metamorphosed rocks.
10- Minerals indicative the grade of metamorphism.

Exam Committee:

*Prof. Dr. Amin Gheith** *Dr. Hamdy Serag*

Mansoura University | Faculty of Science | Geology Department

Date: - 11/01/2015 | Allowed Time: - Two Hours | Full Mark: - 60 Marks

Final Theoretical Exam. - - 1st Term 2014 - 2015

نظام الساعات المعتمدة - برنامج :- الجيولوجيا + الجيوفيزياء - المستوي الثاني

الورقة الامتحانية :- ج 202 - المقرر :- بصريات المعادن والمعادن المكونة للصخور

OPTICAL MINERALOGY AND ROCK-FORMING MINERALS

ANSWER THE FOLLOWING QUESTIONS: - Each Question = 15 Marks (Each part = 5 Marks)

1-A- Explain the Becke line.

B- Describe the double refraction.

C- Write on the plagioclase series.

2-Compare between each pair of the followings:-

A- Optic axis and optic angle.

B- Mica plate and gypsum plate.

C- Birefringence and relief.

3-Classify and explain in detail:-

A- Pleochroism.

B- Interference colours.

C- Rock-forming minerals.

4-Draw the followings:-

A- Nicol prism.

B- Silicate structures.

C- Extinction and extinction angles.

Good Luck & Best Wishes

لجنة التصحيح:- أ.د. حسني حمدانحمامة - د. شعبان السيد مشعل*

Mansoura University Faculty of Science Physics Department	Geolegy, 2nd Level	First Term, 2014-2015 January, 2015 Time: 2 hours.

Vibrations & Waves, (Ph. 211) **Full Mark: 60 Marks**

Answer the following Questions:

1. a)	Find the normal mode of oscillation in the stationary waves.	5 Marks
b)	Find the wavelength and the velocity of a wave given in two directions by: $\varphi = 9 \sin(3x + 4y - 2t)$.	5 Marks
c)	Study the critical damped oscillations.	5 Marks
2. a)	Study the energy of simple harmonic oscillations in an electrical system.	5 Marks
b)	Define the following: i- free simple harmonic motion. ii- damped S.H. motion. iii- Forced oscillation and vi-coupled oscillation and v-the wave number.	5 Marks
c)	Mass of 5 kg is attached with spring has k=500 dyne / cm. After it has the equilibrium position, a force given by 20 sin 5t is applied on it. Find its position at time t.	5 Marks
3. a)	Study the coupled oscillations in case of mono atoms system.	5 Marks
b)	Find the wavelength and the velocity of the two dimensions wave given by: $\varphi = 10 \sin(3x+4y- 5t)$.	5 Marks
c)	A spring is hanged vertically from its upper end. Its lower end is connected by a mass of 10 kg. Then it is pulled down a distance of 4 cm from its steady state position, if the spring constant = 1000N/ m. study its motion.	5 Marks
4. a)	Study the superposition of two perpendicular simple harmonic vibrations.	5 Marks
b)	Find the velocity of propagation of waves in a string if the mass per unit length is 8 gm/cm and the tension is 2 N.	5 Marks
c)	Prove that $\varphi = 5 \cos\theta + 10 \sin\theta - ct$ represents a wave in two directions which makes an angle θ with x-axis.	5 Marks

With our best wishes, Dr Safaa Abdel-Maksoud and.Dr.A.Sarhan.

Mansoura University
Faculty of Science
Physics Department

2nd Level Exam.
January 2015
Time allowed : 2 hrs

Atomic Physics 222 ف

Answer the following questions.

1-a) Discuss the application of elliptical orbits to one electron model. Comment on the degenerate states. (15 marks)

b) Deduce the wavelength in A° and the energy in eV of the spectral line of maximum wavelength of the Balmer series. (15 marks)

2-a) Using the vector atom model, discuss **L-S** coupling and **j-j** coupling. The orbital angular momentum vector of an atom **L=2** and the spin angular momentum vector of the atom **S=1** . Calculate the total angular momentum vector of the atom **J**. (15 marks)

b) For a monovalent element, deduce the possible j values for $\ell = 0,1,2,3$ and the type of each term. Draw the energy level diagram of Na atom and explain the spectral series of this atom. (15 marks)

3-a) Draw and study the energy level diagram of Lithium ion (Li^{++}). (10 marks)

b) Explain the main parts of mass spectrograph, how to operate, clarify the function of the velocity selector and comment on the presence of isotopes. (10 marks)

($c=3\times10^{10}$ cm/s $h=6.625\times10^{-34}$ J.s $R=1.097\times10^{7}$ m^{-1} $1eV=1.6\times10^{-19}$ J)
($e=1.6\times10^{-19}$ C $m_e=9.11\times10^{-28}$ g)

Best Regards

Prof. A. El-Khodary