(الفرقة الثالثة - جيولوجيا - جيوفيزياء عامة (ف ١ : ٣

Mansoura University
Faculty of Science
Geology Department
Date: 16/1/2012

First Term Exam (Jan 2012)
3rd level (Geology)
Subject: Gphy-301
Course: General Geophysics
Time: 2 hours Full Mark: 60

Answer the following questions:

1- A) Match between (A) and (B) (10 marks)

A	B
1- Most magnetic surveys are designed to detect	1- Being negative and the lower positive
2- Depths to refraction and reflection interface can be determined from	2- A variety of geological processes and rock deformation
3- The telluric current method uses	3- One neglects the distance in calculating the depth
4- The denser rocks has greater	4- In sea level
5- The various techniques of geophysical prospecting are based on	5- For determining the basement relief
6- Traps that cause the local accumulation of oil are result of	6- Natural earth currents
7- The datum plane of gravity method	7- Number of fundamental principles of physics
8- In self potential prospecting method the upper end of ore	8- Difference time and distance between exploration and detectors
9- In seismic refraction, at time intercept of travel time curve,	9- Magnetic minerals directly
10- The magnetic method is the best method of geophysical tools	10- Gravitational attraction

B- Write briefly on four of the following (including 1,2) (10 marks)

1-Briefly explain:-

a) In high places upon sea level, free air correction add to reading of instrument

b) In seismic refraction, at critical depth, one neglects the time in calculating the depth

2- Compare between :

a) Seismogram from earthquake and seismogram from nuclear explosion.

b)Gravity field and magnetic field

3- Concepts of magnetic method

4- Electrical self potential prospecting method and its application.

5- Density determination.

II- Answer with YES or NO :- (10 marks)

1- In geophysical dynamic methods, the fields measured vary with time.

2- Diamagnetic group has positive susceptibility.

3- Geophysical prospecting is the searching for unconcealed ores.

4- Reservoir rocks usually are porous rocks

5- The relation between time and distance in seismic reflection is equation of first order.

6- In Wenner 's method of electrical resistivity survey, the distance between electrodes are different

7- Serpentine, granite, gneiss and gabbro are considered as ferromagnetic group.

8- Young's modulus is relation between strain and poisson's ratio.

9- The earth is elliptical, so that the gravity varies at polar and equatorial axis.

10- In seismic methods, time and depth are quantities which are measured.

B-write brie fly on four of the following (including 1,2) (10 marks)

1- Briefly explain:-

a) Telluric current is used to detect sedimentary basins.

b) Electrical prospecting is best method of geophysical tools to detect linear structure.

2- Compare between:

a) Telluric current and self potential current

b) Schlumberger method and dipole method

3- Gravity and Magnetic surveys

4- Factors controlling seismic velocity and L.V.L correction

5- Dot charts method.

III a) Complete the following (10 marks)

1- Any station of earthquake contain ..... units of seismograph.

2- From the difference in time between P waves and S waves, it can be determine the .....

3- Diurnal and normal correction are form kinds of correction of .... Methods

4- In static methods of geophysics, their field do not .....with time.

5- The instrumental readings of gravity and magnetic as made in the field require a correction for the .....of instrument.

6- Bouguer correction is always .....in sign to free-air correction.

7- Seismic prospecting methods are based on the measurement of travel.....of artificial elastic wave.

8- The self potential exploration method is considered as .....current method

9- In gravity and magnetic method, second vertical derivative is used to determine.....subsurface structure.

10- Schematic type magnetometer is used to measure.....magnetic component.

(B) Answer briefly on FOUR of the following (Including 1 and 2)

1. Briefly explain:

a) The magnetic method is the best method of geophysical tools for determining the basement relief.

b) P-waves is reached the earthquake station before S-wave.

2-Compare between:

a) Aeromagnetic survey and magnetic survey.

b) Seismic refraction and seismic reflection.

3- Worden gravimeter and adjustment.

4- Interpretation of gravity and magnetic methods.

5- Determine faults by seismic reflection.

الممتحنون والمصححون*

أ.د محمد رفعت شريف*
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المستوى الثالث - جيولوجيا - تحليل معادن وخامات (2 & 3)

Mansoura University
Faculty of Science
Geology Department
Date:29/12/2011

First Term Exam. (Jan.2012)
Third Level (Geology)
Course No.G314
Course: Minerals and Ores Analysis
Time: 2 hours Full Mark: 60

Answer the Following Questions

Question One : Tick (√) or (X) and correct

1- A single phase exsolves into distinct phases at low temperatures.
2- All minerals are of inorganic origin.
3- An ore is a mineral deposit from which a metal is extracted.
4- A liberated grain is a particle that contains only one mineral.
5- The density of minerals depends on both hardness and crystal structure.
6- Bromoform is a heavy liquid used for density determination of mineral grains.
7- The reflectance of opaque minerals depends on the incident angle of light.
8- An increase in energy of bombarding electrons produces X-ray of shorter wavelength.
9- The critical excitation potential determines the beginning of continuous X-ray production.
10- The shorter wavelength limit is a function of the target that emit X-ray
11- In the X-ray fluorescence analysis the known lattice plain is the target.
12- The accelerated electrons are the source of energy for secondary X- ray production .
13- The X-ray peak intensity in X-ray fluorescence analysis is reduced by increase of dead time.
14- Because of X-ray absorption,X-ray fluorescence analysis,can measure element only with Z >11
15- The back scattered electrons signal is a function only of chemical composition .
16- The track of alpha particles is curved with a length in the range of 20-25 μm.
17- Because of hot spot effect, all material should be wet ground for IR analysis.
18- A thin carbon film is used as thermal conductor coating sample in X-ray microanalysis.
19- Rhodeozonic acid is a dye that gives orange red color with calcite.
20- Illite is a clay mineral belong to the four layers structure with K in the interlayer spaces.

(20 marks)

Question Two: Choose the correct answer

1-Which of the following is a scalar property
a- hardness b- refractive index c- cleavage
2-A mineral strongly attractive to magnet is
a-diamagnetic b- non magnetic c- paramagnetic
3-Colored minerals with high birefringence show under plain polarized light
a- twinkling b- pleochroism c- extinction
4-The fine polishing of samples for study under the reflected microscope is performed using
a- SiC b- diamond c- Al2O3
5-The reflectivity of opaque grains depends
a- wave length b- crystal structure c- chemical composition
6-The arrowhead twin of marcasite is
a- deformational b- growth c- inversion
7-Rutile is a paramagnetic mineral with permeability
a- small positive b- small negative c-large negative
8-Vikers hardness measure the resistance of minerals to
a-fracturing b- scraching c- indentintation
9-The purpose of grinding in preparation of polished section is to
a- smoothen surface b- reduce thicknes c- remove stain
10-Pleochroism of tourmaline is
a – red to yellow b- brown to green c- yellow to colorless
11-X-rays are higher in frequency than
a- δ-rays b- ultraviolet c- infrared
12-Evacuation of X-ray tube is made to
a- accelerate electrons b-reduce absorption c- decrease heat
13-The X-ray detector used in medical labs is
a- fluorescent screen b-ionization device c- photographic film

14-The concentration of element in a sample is directly proportional to

a- peak intensity b- mass absorption c- matrix diversity

15-The coating of sample with carbon film XMA because it is

a- good eletrical condactor b- nonmagnetic c- maleable

16-The short wavelength limit is a function of

a-beam voltage b- Z of the target c- type of filter

17-The bombardment of sample surface with accelerated electrons produces

a-secondary X- ray b primary X-ray c- primary electrons

18-The inert material used as reference material in thermal analysis is

a- δ Al2O3 b- CaF c-Zns

19-Benzidine dye gives blue color with

a-rhodochrosite b- strontianite c- ankerite

20-In X-ray analysis of clays , ethylene glycol is used to differentiate montmorillonite from

a- illite b- chlorite c- kaolinite

(20 marks)

Question Three: Write in Two only of the following

a- Explain how the monochromatic X-ray is produced in the lab and describe how it is used for identification of minerals in a powder sample, illustrate .

b- Write on the structure and classification of clay minerals.

c- The X-ray fluorescence analysis (XRF) is a useful technique to get, with certain precautions , detailed information of chemical composition of geologic samples. Discuss .

(20 marks)

Good Luck

Prof. Omar Hegab

لجنة التصحيح: أد عمر حجاب أد عبد الحميد طه أد حامد النحاس

أد عبد الله شاهين

٢٠١٢. المستوى الثالث - جيولوجيا تكتونية

Mansoura University
Faculty of Science
Geology Department
Date: 23 /01/2012

First Term Exam (January 2012)
Geology program Third level
Subject: G 307 Tectonics
Time: 2 hours Full Mark: 60

Answer the following questions *(20 Marks per question)*

Question 1 write short notes on :

a. Assembly of Pangaea Super-continents. (7 Marks)
b. Tectonic setting of sedimentary basins. (7 Marks)
c. Ophiolite sequence. (6 Marks)

Question 2 write short notes on :

a. Criteria of Continental drift. (7 Marks)
b. Different accommodation zones within the rift model. (7 Marks)
c. Hot spots and its tectonic significance. (6 Marks)

Question 3 write short notes on :

a. Wilson's cycle. (7 Marks)
b. Atlantic Ocean tectonics. (7 Marks)
c. Paleozoic cool swamps. (6 Marks)

جيولوجيا

المستوى الثالث - جيولوجيا - جيوكيمياء - (٢٠٦ ج)

Mansoura University
Faculty of Science
Geology Department
Date: 9/1/2012

Third Year Chemistry
Subject: Geology
Course: Geochemistry (G 306)
Time: 2 hours *Full Mark: 60*

Answer five questions only:

First Question: Complete the following: (10 marks)

1-The atmosphere, biosphere and hydrosphere represent the .....

2-When the Al_2O_3 content reaches > 70%, we can name the rock as .....

3-The ..... separates the more homogenous mantle from the heterogenous crust.

4-..... ..... minerals are the main product of the molten sulphides in the early magmatic crystallization.

5-The ..... appears to be homogeneous and presumably consists of a mixture of (Mg, Fe) SiO_3 with the ilmenite structure and (Mg,Fe)O, periclase.

6-..... depends in large part on its ability to form individual mineral in which it is a major constituent.

7-At the latest sedimentary geochemical separation step, ... are formed.

8-Although ..... is heterogeneous, it is composed mainly of alumino-silicates.

9-The ..... is composed totally of organic matter.

10-The term ..... is the concentration of an element within a particular deposit.

Second Question: Put short expression for each (15 marks)

1-It is of silicate composition.

2-It determines the place of deposition of an element during the formation of sedimentary rocks.

3-It is marked by sudden increase in the seismic velocity.

4-It's density reaches to 3.9 g/cm^3.

5-It helps with course of time consolidation of the loose sediments.

6-It is defined by all processes that working below the zone of weathering.

7-The increase of (Na,K)/Al from 0 to 1 during a stage of earth geochemical cycle.

8-The First major geochemical differentiation of geochemical cycle of the earth.

9-It is composed of ilmenite, pyroxene and periclase and is represented by a quantity of FeO/(FeO+MgO) = 0.1-0.2.

10-They are rich in CaO, CO_2, H_2O and poorer in K_2O and Na_2O.

11-Usually, they form complex anions containing oxygen which are again soluble.

Third Question: (15 marks)

A-Correct the following sentences

1-Gabbros igneous rock is the final occurrence of geochemical cycle of the earth.

2-The hydration controls the precipitation of hydroxides from solution.

3-The Mantle- core interaction on the earth crust is called sedimentation.

4-The chemical composition of sedimentary rocks is less variable than that of igneous rocks.

5-Elements of low hydration are represented by stable anions.

6-The Al_2O_3 and SiO_2 transportation in solution and their redeposition are controlled by oxidation-reduction potential.

7-The interaction of hydro- and atmosphere on the earth crust is called metamorphism.

B- Chose the correct answer:

1-The Al_2O_3 and SiO_2 transportation in solution and their redeposition are controlled by (oxidation reduction potential, pH value, hydration, ionic potential).

2-Metamorphism acts above the zone of (sedimentation, weathering, crystallization).

3-A resistant or detrital minerals are formed from the (mechanical weathering, chemical weathering, first and second together).

4-One of the main mineral composed the upper mantle is (dunite, pyroxene, olivine).

Fourth Question: Put the mark (√) or (X) after each (10 marks)

1-The term Clark concentration is defined as the average percentage of an element in the earth crust.

2-The first geochemical differentiation of the geochemical cycle is the separation of minor elements during magmatic crystallization.

3-The molten sulphides at the first stage of magmatic crystallization are separated as dunite.

4-The hydrosphere-atmosphere interaction on the earth crust is called metamorphism

5-Quartz and muscovite minerals are the less stable against weathering than olivine.

6-The chemical composition of sedimentary rocks is less variable than that of igneous rocks.

7-Elements of low hydration are represented by stable anions.

The Fivth Question: Give short notes on four of the following (10 marks)

1-Chalcophile elements.

2-Camouflaged and captured elements.

3-Products of sedimentation or sedimentary geochemical separation steps.

4-First geochemical differentiation.

5-The composition of the earth as whole.

With best wishes, Prof. Adel Genedi

لجنة الإمتحان والتصحيح*:

أ.د. عادل محمد جنيدى* – أ.د. حامد النحاس أ.د. صلاح عياد – أ.د. حسنى حمدان

Mansoura University
Faculty of Science
Geology Department
Date: 5/1/2012

First Term Exam (Jan 2012)
Third level (Geology Program)
Subject: G 302
Course: Hydrogeology and Geomorphology
Time: 2 hours Full Mark: 60

Answer Three Questions ONLY:

Q.1 Define and explain the following landforms: (20 marks)

a) Mountains (5 marks)

b) Plateaus. (5 marks)

c) Mesas and buttes. (5 marks)

d) Natural levees. (5 marks)

Q.2 Compare between:(20 Marks)

a) Discharge and recharge area. (10 marks)

b) Influent and effluent streams. (10 marks)

Q.3 Define and explain: (20 marks)

a) Water table. (10 marks)

b) Hydraulic gradient. (10 marks)

Q.4 Write briefly on: (20 marks)

a) Classification of reservoirs and types of aquifers. (10 marks)

b) Capillary horizon. (10 marks)

Best Regards

لجنة الإمتحان والتصحيح*:

المستوى الثالث - جيولوجيا - جيوفيزيقا (٢٠١٢)

Mansoura University
Faculty of Science
Geology Department
Date: 2 Jan., 2012

Final Exam (January 2012)
Third Level (Geology Programme)
Subject: G-301 (Metamorphic Petrology)
Total Marks: 60 Time: 2 hours

Answer the following questions:

Question ONE: complete from the following: ***(15 Marks)***

- Metamorphism low temperature limit lies at ...(1)..., while upper limit starts with ...(2)...
- Types of metamorphic pressures include ...(3)..., which generates granulose texture, and ...(4)..., which generates foliated texture, while ...(5)... pressure type reduces the total effective pressure.
- Types of metamorphism related to convergent plate boundaries include ...(6)..., and ...(7)..., while metamorphism related to divergent plate boundaries include ....(8)... and ...(9)...
- Width of contact aureole depends on ...(10), ...(11)... and ...(12)...
- Ca-poor amphiboles characterize ...(13)... metabasites, while Na-bearing amphiboles are characterized ...(14)... metabasites.
- Absence of plagioclase of metabasites characterize ...(15)... facies, while first appearance of staurolite in metapalites indicate ...(16)... facies.
- Marble should contains >50 vol.% ...(17)..., while the rock containing >50 vol.% serpentine minerals is known as ...(18)...
- In metapelites K-feldspars is exist either in ...(19)... or ...(20) mineral zones.
- Dynamic metamorphism is yielded ...(21)... texture, while hornfelsic texture is related to ...(22)... metamorphism.
- The maximum geothermal gradient locates at ...(23)..., and ultimate metamorphic pressure (~1000 kbars) is characterize the ...(24)... metamorphism.
- Metamorphism should developed in ....(25)..... state and generally done in .....(26).... system, while metamorphism with fluids is known as ...(27)...
- Yielded metamorphic rocks depend on ...(28)..., ...(29)... and ...(30)...

Question TWO: For the following mineral assemblages, write on (1) protolith type, (2) metamorphic condition, (3) metamorphic facies and (4) possible rock name: ***(16 marks)***

1- Omphacite + garnet

2- Quartz + plagioclase + K-feldspar + garnet + sillimanite

3- Calcite + wollastonite + diopside

4- Plagioclase + hornblende + garnet

5- Serpentine minerals

6- Quartz + plagioclase + biotite + cordierite

7- Quartz + actinolite + albite + chlorite

8- Plagioclase + hornblende + garnet + clinopyroxene + orthopyroxene

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Question Three*: Choose the correct answer from the following:** ***(14 Marks)

1- Metabasites are rich in (quartz – amphiboles – garnet – mica).

2- Low P-T condition meta-carbonate is indicated by existence (calcite – dolomite – aragonite – ankerite).

3- Glucophane in metabasites indicates (LP – HP – LT – HT) condition.

4- OPX in metapelites indicates (barrovian – buchan – ultra-high – hornfelsic) metamorphic condition.

5- Soapstone is composed of (serpentine – talc – pyroxene – chlorite) mineral.

6- The longest duration time is the (cataclastic – contact – impact – orogenic) metamorphism.

7- Slates are formed by (ultrahigh – high – low - medium) grade metamorphism.

8- Metasomatism of carbonate rocs is responsible to generate (skarn – schist – eclogite – granulite).

9- Metamorphism of dunite yielded (amphibolite – phyllite – serpentinites – marble).

10- Lower sillimanite-zone does not contain (K-feldspar – plagioclase – garnet – biotite)

11- Illite is stable at (ultra-high – medium – low – very low) metamorphic condition.

12- Cataclastic texture is related to the effect of (HP/LT – LP/HT – LP/LT – HT/HP) condition.

13- In metapelites,LP condition is indicate by existence of (kyanite - andalusite – sillimanite – staurolite).

14- Partial melting is responsible to generate (eclogite – granulite – migmatite – phyllite).

Question Four*: Compare briefly between the following pairs** ***(15 marks)

1- Orogenic and impact metamorphism.

2- Blue-schist and amphibolite facies metabasites.

3- Gneisses and green-schist.

4- Mineral assemblages and significance in both metapelites and metabasites.

5- Sources of heat and stress for metamorphism.

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Examiners:

Prof. Mahmoud Kora – Prof. Salah Ayyad – Prof. Mahrous Abu El-Enen*- Dr. Hesham Sallam