مستوى الثالث - جيولوجيا - احصاء تطبيقي

Mansoura University
Faculty of Science
Math. Dept.

Exam : Jan. 2011
Time : 2 hours
3rd year (Spec. Geol.)

Subject: Applied statistics

Answer the following questions: ***(Total 80M.)***

[1] a- The following table shows the age distribution (in years) of patients who complained of flu ***(15 M.)***

Age	10-	20-	30-	40-	50-	60-
No. of patients	10	16	24	20	18	12

i) Construct the ascending cumulative frequency table, plot it and hence use it to find the median of the distribution.
ii) Find the mode and the coefficient of variation of the distribution.
b- A coin is biased so that a head is twice as likely to occur as a tail. ***(10 M.)***
If the coin is tossed10 times, find (i) the probability that no head occur.
(ii) the probability that the number of heads will be more than one.

[2] a- If X is a random variable having the pdf ***(10 M.)***
$f(x)=\begin{cases}2x, & x\in[0,1]\\ 0, & O.W.\end{cases}$, find (i) $Var(X)$. (ii) $P(X\geq 1/2)$.
b- If the mean and the standard deviation of a random sample of size 49 is drawn from a normal population are 3.2 and 0.4, respectively. Find 99% confidence interval for μ. ***(7 M.)***
c- If the heights of 500 students are normally distributed with mean 70 inches and variance 6 inches. How many students you expect to have i)heights between 66 and 72 inches? ii)heights less than 65 inches. ***(10 M.)***

[3] a-Test the hypothesis that the average weight of boxes dog food is 10 ounces if the weights of a random sample of 10 boxes are 10.2, 9.7, 10.1, 10.3, 10.1, 9.8, 9.9, 10.4, 10.3 and 9.8 ounces. Use a 0.01 level of significance and assume the distribution of weights to be approximately normal. ***(10 M.)***

Please turn over

b- The following table shows the heights x (in cm) and the weights y (in kg) of 10 students *(10 M.)*

x	160	152	180	165	170	187	182	185	165	170
y	62	50	78	62	70	85	80	85	62	75

Calculate Spearman's rank correlation coefficients of heights and weights.

c- An owner of a company clams that 90% of items produced by a certain process are non defective. After some improvements in the process he clamed that the proportion of defectives is less than 10%. In a sample of 80 items produced with the new process 5 are defective. Can you conclude that the method has been improved?, at 0.05 level of significance. *(8 M.)*

Hint:

$t_{10,0.005} = 3.169,\ t_{9,0.005} = 3.25,\ z_{0.005} = 2.58,\ z_{0.05} = 1.645, z_{0.001} = 1.33.$

Best wishes.

Dr. Beih El-Desouky

الفرقة الثالثة - جيولوجيا - جيولوجيا بيئية

Mansoura University
Faculty of Science
Geology Department

Date: 15/1/2011
Time: 2 hours

Final Exam.
Subject: Hydrogeology and Geomorphology
Code: G 302
3rd level, Geology Program
Full marks: 60 marks

Answer Three Questions ONLY

Q1. 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).

Q2. (20 marks)

a) Discuss the factors controlling the type and rate of weathering. (10 marks).
e) Mention only five fundamental concepts on geomorphology. (10 marks).

Q3. Define and explain: (20 marks)

a) Water table. (5 marks).
b) Hydraulic gradient. (5 marks).
c) Influent stream. (5 marks).
d) Discharge areas. (5 marks).

Q4. Write briefly on: (20 marks)

a) Classification of reservoirs and types of aquifers. (10 marks).
b) Groundwater occurrences in non-saturated zone. (10 marks).

لجنة التصحيح:
أ.د. محمود قورة إ. د. عبد القادر زلطة أ.د. عمر حجاب د. حمدى سراج الدين*

بترول - جيولوجيا - جيوكيمياء (٢٠٢٩)

Mansoura University
Faculty of Science
Geology Department
Date: 17/1/2011

Third Year Exam (January 2011)
Credit Hours System
Subject: Geology 306
Course: Geochemistry
Time: 2 hours Full Mark: 60

GEOCHEMISTRY

The first question: Complete the following: .... (20 marks)

1-Sedimentation is defined as .....
2-The ..... are rich in CaO, CaO_2, and H_2O and poorer in Na_2O and K_2O than ....
3-When the Fe_2O_3 content is reached to more 75% the resulted rock is named ..... .
4- ..... is significant in all mineral forming processes in an aqueous media.
5-The (Na,K)/Al content for zeolite in both dis- and continuous reaction series reachs.....
6- ..... show affinity for silicates and have ..... potential.
7- ..... consist of chemically undecomposed weathering residues.
8- ..... is one of the physicochemical factors in sedimentation.
9-Concentration of ..... is considered the latest step in sedimentary geochemical separation.
10- ..... are the products of an extensive chemical differentiation in the earth.

The second question: Put a short expression to each of the following: .. (20 marks)

1-You can find me at many places on the geochemical cycle of the earth and easily at the end stage of magmatic crystallization.
2-I am the essential mineral of the igneous rocks.
3-I take my place in course of time and consolidation of the loose sediments. 4-We are sum of processes working below the weathering zone.
5-I am a nesosilicate mineral which is stable in high grade metamorphism.
6-The separation of the earth into iron core, silicate mantle and crust.
7-In cataclastic rocks, I am alone the main factor responsible for metamorphism.
8-It is composed of ilmenite, pyroxene and periclase and is represented by a quantity of FeO/(FeO+MgO) = 0.1-0.2.
9-I am the controller of the earth magnetic field.
10-In metamorphic rocks, if corundum is more than 20% by normative analysis, you can easily know me.
11-We are formed in great part of clay minerals.

The third question: ..... (20 marks)
A-Put (√) and correct the wrong (X) mark for the following sentence: .....(12 marks)

1-The hydration is significant in controiling the precipitation of hydroxides from solution.
2-Elements of low hydration are represented by soluble anions.
3-The molten sulphides at the first stage of magmatic crystallization separate as dunite.
4-Epidote is a phyllosilicate mineral.
5-Quartz mineral is the less stable against weathering than olivine mineral.
6-Lithophile elements have strong affinity for oxygen and silicates.

B-Chose the correct answer: ..... (8 marks)

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-Spessartite is metamorphic (Mn-, Fe-, Mg-) garnet mineral.

With best wishes, Prof. Adel Genedi

الإمتحان والتصحيح*:
أ.د. عادل محمد جنيدى* ، أ.د. حامد النحاس ، أ.د. صلاح عياد ، د. حسنى حمدان

طبقوليات - جيولوجيا - (ج ٣٠٧) - نظرية تكوينية

Mansoura University
Faculty of Science
Geology Department
Date: 19 /1/2011

كلية العلوم
جامعة المنصورة

First Term Exam (January 2011)
Geology program Third level
Subject: G 307 Tectonics
Time: 2 hours Full Mark: 60

Answer the following questions **20 Marks for each**

Question 1 **20 Marks**

a. Write on the assembly of Pangaea super continents. *(7 Marks)*

b. Write on oceanic - oceanic convergence, continental - continental divergence and transform plate boundaries. Give example of each type *(6 Marks)*

c. Write on the ophiolite sequence. *(7 Marks)*

Question 2 **20 Marks**

a. Write on the Wilson tectonic cycle and give example for each event. *(7 Marks)*

b. "The pacific Ocean is constituted of several Oceanic plates" please explain the tectonic relation of these oceanic plates. *(6 Marks)*

c. Write on the basin evolution and its impacts on the occurrences of Oil. *(7 Marks)*

Question 3 **20 Marks**

a. Write short notes on the hot spots and its tectonic significance. *(7 Marks)*

b. Compare between Caledonian and Hercynian Orogenies. *(6 Marks)*

c. Write short note on the criteria of fault recognitions. *(7 Marks)*

لجنة الممتحنين:

أ.د. صلاح البيلى أ.د. أحمد عبد اللطيف أ.د. عبد الله شاهين د. أحمد شلبى

Mansoura University
Faculty of Science
Geology Department
Date: 24/1/2011

First Term Exam. (Jan.2011)
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- The metallurgical slages contain real minerals.
2- The crystal structure of mitamicts is produced by annealing.
3- A detailed chemical composition is sufficient for mineral identification.
4- A mineral particle contains any number of different minerals.
5- The density of minerals depends on both chemical composition and crystal structure
6- The value of density vary with crystallographic orientation of minerals.
7- hardness measures the resistance of mineral to indentation.
8- Small number of minerals fluoresces under ultraviolet light.
9- Cathodoluminescence is the property of minerals to fluoresces under electron bombardment
10- Internal reflections are best seen in the translucent minerals.
11- The width of the characteristic X-ray line is extremely large.
12- Some of the produced X-rays are absorbed by the wall of generator.
13- The back-scattered electrons produce information about the topography of specimen surface
14- The electron probe microanalysis can determine all elements above Z = 4.
15- In X-ray microanalysis the samples are coated with a thin layer of carbon.
16- The track length of alpha particles is in the range of 20-25 μm.
17- Infrared absorption yield information on both structure and bonding of substances.
18- In infrared analysis, particle size of analyzed sample should be less than infrared wavelength
19- δ Al2O3 is generally used as inert reference material in Differential Thermal Analysis.
20- The loss of volume is measured in Thermogravimetric Analysis

Question Two: Choose the correct answer

1-Which of the following is vector property
a- electrical resistance b- color c- cleavage
2-Pycnometer is the suitable tool for measuring density of
a-fine grained material b- dimensionless solid c- geometrical solid
3-Vikers hardness measures the resistance of mineral to
a- scratches b- indentation c- cracking
4-Calcite is a diamagnetic mineral with magnetic permeability
a- small negative b- large negative c- small positive
5-Pleochroism of hypersthene is
a- white to brown b- brown to black c- pink to green
6-The purpose of grinding in preparation of polished section is to
a- reduce thickness b- concentrate grains c- show isotropism
7-Reflectance of opaque minerals depends on
a- wavelength of light b- surrounding minerals c- type of microscope
8-Parallel row of triangular pattern of cleavage is characteristic to
a- pyrite b- hematite c- galena
9-The metal target in an X-ray tube forms
a- filament b- anode c- cathode
10-The critical excitation potential depends on
a-nature of target b- applied voltage c- current frequency
11-The current produced in the proportional counter is proportional to
a- X-ray intensity b- applied potential c- Bragg angle
12-The Ni filter is used with Cu X-ray to eliminate
a- Kα radiation b- Kβ radiation c- Lα radiation
13-The intensity measured in X-ray analysis is that of
a- incident beam b- transmitted beam c- diffracted beam

14-The diffracted beams on the photographic film of single crystal is marked by
a- bright spots b- straight lines c- curved lines

15-X-ray fluorescence cannot provide any information about
a- mineral identity b- grain size c- chemical composition

16-The concentration of elements in samples analyzed by electron probe is calculated by
a- peak intensity b- peak position c- peak width

17-The back-scattered electrons signal is a function of
a- atomic number b- crystal structure c- depth of measuring

18-Coating samples for electron probe analysis with carbon tend to reduce
a- thermal effect b- magnetic effect c- polarization effect

19-In DTA curves the dehydration reaction is represented by an endothermic peak at
a- low temperature range b- mid temperature range c- high temperature range

20-The thermal reaction which is not accompanied by any loss in weight in clay analysis is
a- dehydration b- dehydroxylation c- transformation

Question Three: Write on Two only of the following

a- The X-ray fluorescence spectroscopy is an important tool for chemical analysis of geologic samples; discuss principles, sample preparation precautions and interpretation

b- A great number of ore minerals are opaques and the reflected optical microscope plays a major part in studying this group of minerals; discuss with emphasis on preparation of samples and general optical properties.

c- Thermal analyses are useful in identification of clay minerals; show how with regard to compartments of apparatus and interpretation of data.

Good Luck

Prof. Omar Hegab

لجنة التصحيح:-

أ.د. عمر حجاب أ.د. عبدالحميد طه أ.د. حامد النحاس أ.د. عبدالله شاهين

المستوى الثالث - جيولوجيا - جيوفيزياء عامة (جف ٣٠١)

Mansoura University Faculty of Science Geology Department First Term Exam 22/01/2011		Subject: Geophysics (3 · 1) (301 كود المقرر(جف Course: General Geophysics المستوى الثالث جيولوجيا Time: 2 hours Full Mark: 60

هام: الإمتحان على ٣ صفحات

Answer these THREE questions: (20 Marks for each question)

Q1. Choose the correct underlined word(s) (20 Marks; one for each statement)

1- (P, S, Rayleigh, Love, all) waves are one of the most important components of ground-roll noise.
2- The rock particles move in the direction of propagation of the (P, S, Rayleigh, Love) waves.
3- VR/Vs depends on (Poisson's ratio, shear modulus).
4- VR/Vs is usually (>, <, =) 1.0.
5- Attenuation of body waves with distance is (less than, greater than, equals to) that for surface waves.
6- At a distance (less than, greater than, equals to) the crossover distance Xcros, the head wave arrives first.
7- Explosives give a pulse of (low frequency and amplitude, high frequency and amplitude, high frequency and low amplitude, low frequency and high amplitude).
8- Explosives give a pulse of very (short, long) duration.
9- Geophone is used to detect frequencies (below, above, equal to) its resonant frequency.
10- All marine reflection surveying are accomplished using (simple-spread, split-spread, CDP) arrangement.
11- Dry coarse sand or gravel may have (low, high) resistivity.
12- An electrode array with constant spacing is used to investigate (vertical, lateral) changes in apparent resistivity.
13- In resistivity survey with varying electrode spacing, (Wenner, Schlumberger) array is preferred.
14- Gravity value (decreases, increases) with increasing latitude.
15- Sedimentary basins usually produce gravity (lows, highs).
16- The attraction of the sun and the moon results in a cyclic change in gravity which may be corrected by (drift, tidal) corrections.
17- As a result of the earth's magnetic field, rocks containing magnetizable minerals show (a remanent,an induced) magnetization.
18- The magnetic north is (inclined, declined) with about 11.5° to the geographic north.

19- The inclination of the earth's magnetic field is (0°, 90°) at the magnetic equator.
20- In mineral exploration, flight-line spacing is a (few hundred meters, few kms).

Q2. Put Yes or No and correct the underlined word if it is false. (20 Marks; one for each statement)

1- Shallow reflection methods are used in the field of site investigation for estimating the depth to the bedrock.
2- During passage of P waves, rocks are sheared.
3- Attenuation is less pronounced for less consolidated rocks.
4- The transmission coefficient for a normally incident wave is
$r = Ar/Ai = \rho 2\ V2 - \rho 1\ V1 / \rho 2\ V2 + \rho 1\ V1$
5- Velocity of most igneous rocks and evaporites is controlled by elastic constants of the rock-forming minerals.
6- In highly-consolidated rocks, the velocity depends on the fluid filling the pore-spaces.
7- The output seismogram from dynamite must be cross-correlated with the sweep signal to be interpretable.
8- In processing stage, summation (gathering) process is used to improve reflected signal against noise.
9- The single-ended and split-spread arrangements are both multi-channel but single-fold coverage.
10- Deconvolution process is applied to remove the low-pass filter effect of the earth.
11- If a symmetrical array is used, the resistivity value obtained is associated with the center of the array.
12- In resistivity survey with constant electrode spacing, Wenner array is preferred.
13- The geometric factor (k) in resistivity relations is a function only of the geometry of the electrode arrangement.
14- The current used in resistivity surveying is either DC or AC of low frequency (about 20 Hz).
15- Bouguer anomaly = observed gravity corrected for elevation and topography – theoretical value on the reference (spheroid) at the same latitude.
16- Bouguer anomalies contain the small scale (regional) anomalies and the smooth broad (local) ones.
17- Surveying with ship-borne gravimeters is difficult due to wave motion acceleration and Eötvos effect.
18- The earth's magnetic field has its minimum value at the poles and its maximum value at the magnetic equator.
19- The proton magnetometer measures the (vertical component of, horizontal component of, total) magnetic field.

20- The sudden disturbances in the earth's magnetic field are known as (diurnal changes).

Q3. Complete: (20 Marks; one for each statement)

1- The resolution of the seismic method is its ability to separate closely-spaced structures which depends on ……..
2- Body waves include…….. and …….. waves.
3- Attenuation occurs due to …….. and ……..
4- Conventional detectors are sensitive only to the vertical component of ground motion, thus it is assumed that the events picked on a seismogram are either …….. or …….. waves.
5- The …….. wave travels along the interface with the higher velocity V2.
6- Velocity of the common sedimentary rocks is controlled mainly by ……..
7- In marine surveying air guns are usually used in …….. to improve S/N ratio.
8- Static corrections include ……. and …….. corrections.
9- …….. is a processing step to put the reflection points on their true locations.
10- If the geologic section surveyed has a ……., there will be an error in depth estimation by seismic refraction method.
11- Mineral grains are essentially ……., except in some materials such as metallic ores.
12- Properties that affect the resistivity include composition, ……., ……., ……..
13- To investigate changes in resistivity with ……., the size of electrode array is varied.
14- …….. corrections are mainly due to the departure of the earth's shape from spherical to ellipsoidal shape.
15- Elevation correction includes …….. and …….. corrections.
16- Gravity surveys need reconnaissance topographic and geologic surveys together with the collection of unweathered samples for …….. determinations.
17- In gravity ……., the gravity differences are concerned rather than the absolute values.
18- The constant of proportionality between the inducing field and the magnetization is known as the magnetic ……..
19- …….. magnetization occurs in igneous rocks on cooling in the earth's magnetic field.
20- Aeromagnetic surveys are often of a …….. nature.

مع تمنياتى بالتوفيق أ. د. إبراهيم كرات

Mansoura University
Faculty of Science
Geology Department
Date: 12 Jan., 2011

Final Exam (January 2011)
Third Level (Geology Programme)
Subject: G-301 (Metamorphic Petrology)
Total Marks: 60 **Time**: 2 hours

Answer the following questions:

<u>Question ONE</u>: Choose the correct answer from the following: ***(15 Marks)***

1- Metapelites are (mica – carbonate – amphibole - quartz) –rich metamorphic rocks.

2- In metabasites, plagioclase does never exist in (greenschist – amphibolite – eclogite – granulite).

3- High-pressure meta-carbonates is indicated by existence (calcite – dolomite –aragonite – ankerite)

4- Clinopyroxenes in metabasites indicate (LP – HP – LT – HT) condition.

5- Sapphrine in metapelites indicates (barrovian – buchan – ultra-high – hornfelsic) metamorphic condition.

6- (Contact – Hydrothermal – Orogenic – Cataclastic) metamorphism is the longest time duration type.

7- Hornfelsic texture characterizes (cataclastic – orogenic – subduction zone – contact) metamorphism.

8- Amphibolite facies metapelites is indicated by first appearance of (staurolite – garnet – cordierite – muscovite).

9- Serpentinites are formed as metamorphism of (granite – shale – limestone – dunite).

10- Skarn is generated as a result of (metamorphism – metasomatism – partial melting – differentiation).

11- Upper sillimanite zone of metapelite is indicated by existence (anorthite – calcite – muscovite – K-feldspar).

12- Orogenic metamorphism is accompanied (divergent – convergent – shear) plate motion.

13- Chlorite is stable at (ultra-high – high – low – medium) metamorphic condition.

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

15- Sanidinite facies is related to (barrovian – Buchan – hornfelsic - blue-schist) series.

<u>Question TWO</u>: complete from the following: ***(15 Marks)***

- The shortest metamorphic type is ....(1)..., which characterized by a P-T conditions of ....(2).... and ....(3).....
- Metamorphism should developed in ....(4)..... state and generally done in .....(5).... system
- Lack of foliation in metamorphic rocks generates as a result of influence .....(6).... or ....(7)....
- In metapelites, kyanite indicates ....(8).... condition, sillimanite indicates ....(9).... condition, while andalusite indicates ....(10).... condition.
- In metabasites, existence of glucophane indicates ....(11).... condition, while zeolites indicate ....(12)... condition, and garnets formed under ....(13)... condition.
- The minimum and maximum geothermal gradient coincides with ....(14).... And ....(15) metamorphic types, respectively.

---------- ***P.O.T***

Question THREE: ***(15 marks)***

a- ***write on the 1) mineral composition, 2) textures, 3) protoliths, and 4) grade of metamorphism of the following metamorphic rocks:*** ***(10 marks)***

1- Eclogite 2- MP-amphibolite 3- Slate 4- Soapstone

b- Write briefly on: Sources of pressure and temperature during metamorphism ***(5 marks)***

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

1- Buchan and Barrovian metamorphism in metapelites

2- Impact and burial metamorphisms.

3- Calc-silicates and marble.

4- Open and closed system migmatites.

5- Contact and dynamic metamorphisms.

---------- With our best wishes

Examiners: Prof. Mahmoud Kora – Prof. Salah Ayyad – Prof. Amin Gheith - Dr. Mahrous Abu El-Enen