بسم الله الرحمن الرحيـــم

University of Assiut
Faculty of Science
Department of Geology

3rd Level Examination for petroleum geology students
In Field Teqniques and Mapping (304PG)

Time: Two Hours **50 Marks** **May, 2015**

ملحوظة هامة: الأمتحان يتكون من صفحتين

Part One (25 Marks)

Answer the following questions:

1- Summarize briefly the criteria demonstrating faulting and sense of movement. (9 Marks)
2- Write short notes on the different kinds of physiographic evidences used for recognition of faults. (8 Marks)
3- Compare and contrast between two only of the following geomorphological pairs: (8 Marks, 4 Marks for each)
   i- Lava cones and volcanic domes.
   ii- Fracture cleavage and slip cleavage.
   iii- Craters and Calderas.

Part Two (25 Marks)

1- First Question (5 Marks)
Choose the correct answer: (5 Marks, one Mark for each)

a- Broken pieces of what types of rock are deposited into layers and cemented together to form sedimentary rock?
a- sedimentary b- igneous c- metamorphic d- all of these

b- A deposit with large clasts (coarse grains) at the base that become finer upwards is known as a.....
a- ripple marks b- straification c- graded bed d- sand dunes

c- Only one instrument use for measuring the angles in a traverse
a- prism b- chain c- clinometar d- total station

d- The sedimentary structure shown at the right hand photograph is .....
a- fold b- flute casts
c- cross bedding d- symetrical ripple marks

e- Burrows left by animal activity are known by ..... sedimentary structure.
a- primary b- secondary c- tectonicc d- non of these

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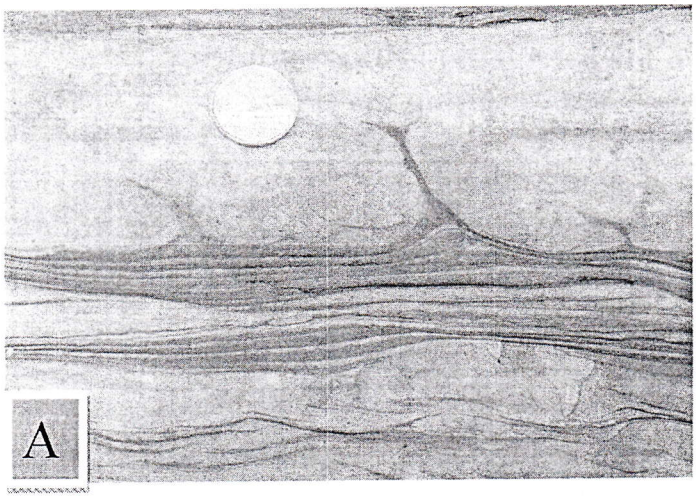
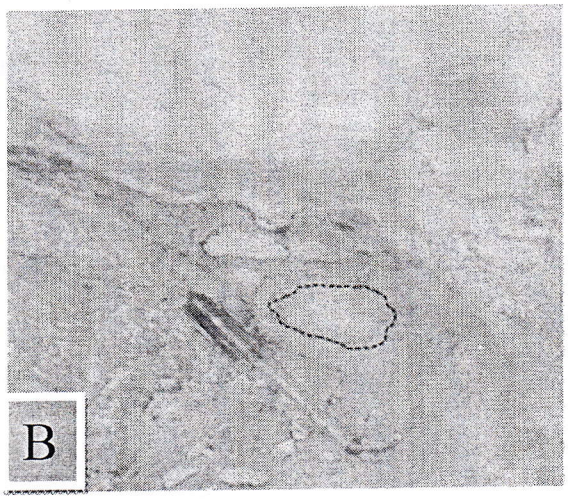
2- Second Question (10 Marks)

From the underlying field photographs (A & B), descibe each one illustrating your answer by drawing.





3- Third Questioin (10 Marks)

i- Write on ***<u>one only</u>*** of the following: (5 Marks)

a- The filed criteria of unconformities.

b- Important of geological field mapping.

ii- Define the following terms: datum section - mud cracks (5 Marks)

---------- ***GOOD LUCK*** ----------

Prof. Dr. Ali A. Khudier

Prof. Dr. Nageh A. Obaidalla

Geology Department Faculty of Science Assiut University		Time: 2 hours May 2015 Second-term final examination

Subject: Sedimentology and Sedimentary environments (325 GP)
Students: 2nd level of Petroleum Geology- Second term class (2014-2015)
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Part One: Sedimentology (25 Marks)

Answer the FIRST Question and Only ONE of the others:

I- The First Question (إجبارى): (10 Marks)

Indicate by the mark (X) or (√) and correct the incorrect sentences:

1) Calcite is the main mineral constituent of the evaporate minerals ( ).
2) The better sorted the sediment the greater the porosity ( ).
3) Polymictic conglomerates are composed of clasts are made up of only one rock type ( ).
4) Solution is the most effective means of creating secondary porosity ( ).
5) Layers of Mg-O/OH in a clay mineral are referred to as gibbsite layers ( ).
6) Glacial till that is transported within glacial ice is typically rounded in shape ( ).
7) Clastic sedimentary rocks are formed by the precipitation of minerals from solution by either organic or inorganic processes ( ).
8) Eolian (windblown) sands commonly have a higher sphericity than water transported sand ( ).
9) Scour marks are caused by imprints of objects ( ).
10) Heavy minerals are finer than the less dense minerals with which they are deposited ( ).

II- The Second Question (إختيارى): (15 Marks)

A) Write briefly on the general classification of sedimentary rocks. (5 Marks)
B) Compare between the following: (10 Marks)
i) Roundness and sphericity
ii) Porosity and permeability
iii) Simple bedset and composite bedset
iv) Graded bedding and massive bedding
v) Hummocky cross stratification and Heterolithic stratification

III- The Third Question (إختيارى): (15 Marks)

Write on of the following:

A) General classification of conglomerates and breccias. (5 Marks)
B) Evaporites and its economical importance. (4 Marks)
C) Gravity Flow Deposits. (3 Marks)
D) Classification of sandstones. (3 Marks)

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Part Two: Sedimentary environments (25 Marks)

Answer only Five questions out of the following, extra answers will not be considered (25 Marks):

1. Depositional environments in ancient sediments are recognized by using a combination of sedimentary facies, facies associations, sedimentary structures and fossils, particularly.....assemblages, as they indicate the environment in which they lived (5 Marks).

(A) Mollusca. (B) Dinosaur. (C) Trace fossils.
(D) Arthropod. (E) None of the above.

2. Discuss in detail the following items (5 marks):

(A) Geometry as a diagnostic defining parameter of a sedimentary facies (2.5 marks).
(B) The three defining parameters of a sedimentary environment (2.5 marks).

3. True or false (5 marks)

(A) Sedimentary facies of net erosion are typically subaqueous and consist largely of the mountainous areas of the world (One mark).
(B) It appears that depositional sedimentary environments are predominantly terrestrial (One mark).
(C) Delta environment is an example of a continental environment (One mark).
(D) Finer grain sizes like silts and clays tend to show a high energy environment (One mark).
(E) A sedimentary facies is a part of the earth surface which can be defined and distinguished from others by its physical, chemical and biological characteristics (One mark).

4. Discuss in detail the alluvium of braided rivers (5 marks).

5. A meandering river channel..... (5 marks).

(A) Usually has a relatively narrow and deep cross section (One mark).
(B) Usually is the most common type of natural channel in the world (One mark).
(C) Usually is dominated by suspended load sediment types (One mark).
(D) Usually is found only in arid climate regions (One mark).
(E) Usually has a gentler longitudinal gradient than a braided river channel (One mark).

6. Write briefly on the relationships between sedimentary environments and sedimentary facies (5 marks).

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Good Luck

Dr. Abdalla El Ayyat
Dr. Mahmoud A. Essa

Assiut University
Faculty of Science
Department of Geology

Date: June 2015
Time allowed: 2 Hours

Final Exam

Subject: electric Methods (G 358)
Students: Third level (All groups)
Total marks 50

I- Answer the following questions 20 marks

1- The earth resistivity horizontal and vertical variation of the subsurface layers can be studied by two earth resistivity techniques, these techniques are:-

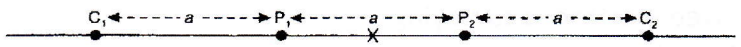
a- .....

b- .....

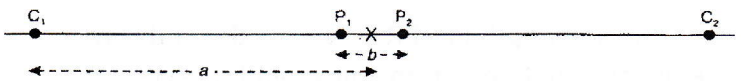
Discuss each technique

2- The following figures show the distribution of the current and potential electrodes in the famous electrode arrays. Write the equation of calculating the apparent resistivity opposite each array.

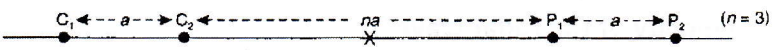
Wenner



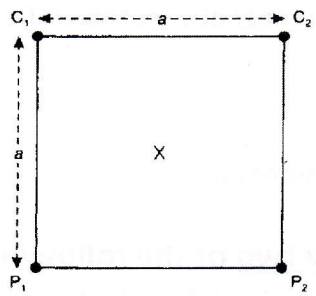
Schlumberger



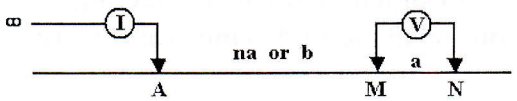
Dipole–dipole



Square



Pole-Dipole



3- The letters Q, H, K and A representing curve types of geoelectric model for three layers.

a- Write the formula corresponding to each curve type.

b- Burn eight curve types representing geoelectric models of four layers

c- Draw sketch for each curve type and the corresponding geoelectric model.

See the next page

4- Mentioned the advantage and disadvantage of ER and EM methods.

II- Chose the correct answer from <u>four only</u> of the following questions(comment on your choice) 20 marks

1- During surveying by SP over the cone of depression resulted from groundwater pumping from definite will, the negative peak of the representing curve pointing to:-
   a- The maximum axis of the depression
   b- Zero depression
   c- The minimum axis of the depression

2- The high values of metal factor or chargeability measured by applying IP method are referred to:-
   a- Conductive zone
   b- Resistive zone
   c- Impermeable and dry formation

3- The self potential gradient can measured by
   a- Fixed electrodes surveying
   b- Movable electrode surveying
   c- Fixing one electrode and moving the other

4- The penetration depth in GPR surveying depends on
   a- The distance between transmitter and receiver
   b- Conductivity of the subsurface layers
   c- Velocity of the radar wave

5- Time domain electromagnetic method (TDEM) the secondary field measured by:-
   a- The same coil
   b- Another coil
   c- Low frequency antenna

III- Write about <u>only two</u> of the following:- 10 marks

1- Applications of the ER method in groundwater exploration.
2- Application of GPR method in engineering.
3- Applications of SP method in mineral exploration.

==========Best wishes ==========

Prof. Dr. M. M. Senosy

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بسم الله الرحمن الرحيم

جامعة أسيوط
كلية العلوم - قسم الجيولوجيا

امتحان التحرير لطلاب المستوى الثالث بكلية العلوم شعبة الجيولوجيا

المادة: الحفريات الدقيقة والجيولوجياالتاريخية (315ج)
(315G) (Micropaleontology & Historical Geology)
دور يونيو2015/2014م

الزمن: 3 ساعات

الدرجة:50 درجة

ملحوظة الامتحان يتكون من أربع صفحات

الورقة الأولى

I- Micropaleontology (30 Marks)

Answer the following questions

First question: (10 Marks)

Write on four only of the following:

1- The main differences between pollen and spores.
2- Types of plant fossils.
3- Application of palynomorphs in biostratigraphy.
4- Tabulation in dinoflagellates.
5- Preservation of palynomorphs in acidic environments.
6- Life cycle of dinoflagellates.

Second question: (2.5 Marks)

Mark by using True (√) or False (X):

1- Both palynomorphs and sediments are decomposed in oxygen-rich substrates.
2- HCl should be added first to calcareous sediments to prevent formation of calcium fluoride.
3- There is no preferred orientation of palynomorphs in sediments such as that observed in invertebrates.
4- Chitinous foraminifers are considered palynomorphs.
5- Palynomorphs are best preserved in carbonate environments.

Third question:

Complete: (2.5 Marks)

1- Excystment leads to the formation of ..... in dinoflagellates.
2- Palynomorphs are acid-resistant therefore their extraction from sediments is mainly dependent on .....
3- Intercalary archeopyle occurs in ..... cysts.
4- Scolecodonts, acritarchs, fungi, chitinozoa and bisaccates are all considered .....
5- Pollen and spores are usually preserved in sediments as .....

الورقة الثانية

Fourth question:

Choose the correct answer: (4 Marks)

1- The Calcite Compensation depth is the depth of ocean where ..... equal .....
   a- acidity – dissolution potential
   b- temperature – the dissolution point
   c- carbonate saturation – carbonate undersaturation
   d- carbonate dissolution – carbonate supply

2- The wall structure of the conodonts is:
   a- $CaCO_3$ b- $CaPO_4$ c- $Ca\ SO_4$ d- tectinous

3- Which part of the conodonts has been preserved?
   a- teeth b- bones c- skull d- shell

4- The general shape of the imprints of conodonts show an:
   a- snail-like structure b- fish-like structure
   c- snake-like structure d- worm-like structure

5- ..... are reef-building foraminifera.
   a- fusulinids b- nummulitids c- marginoporids d- all the previous

6- In sea water, CO_2 is added mostly by ..... and O_2 is added mostly by ,.....
   a- respiration of marine organisms - photosynthesis
   b- photosynthesis - wave action
   c- wave action - respiration of marine organism
   d- volcanic activity - the atmosphere

7- Due to their rapid evolution of species, they represent an important diagnostic fossil in biostratigraphy.
   a- planktic foraminifera b- benthic foraminifera
   c- ostracoda d- all the previous

8- Remnants of the oldest conodont faunas consist primarily of simple.
   a- Coniform b- Ramiform c- Pectiniform d- all the previous

Fifth question:

Write the scientific expression of the following: (3 Marks)

1- The study of the relationships between organisms and their environments.
2- The capacity of sea water to dissolve calcium carbonate.
3- The depth where light is sufficient for photosynthesis.
4- Alternation of sexual and asexual generation.
5- Water body marks by salinity up to 57‰.
6- Environment without oxygen.

الورقة الثالثة

Sixth question:

Choose only one of the following: (8 Marks)

1- Compare between radiolaria and benthic foraminifera in:
wall structure – mode of life – shape of shell – reproduction

2- Discuss and explain briefly the different environments of Ostracoda.

II. Historical Geology (20 Marks)

Answer the following questions

First question: (5 Marks)

Choose the correct answer:

1- Which of the following covers over 80% of earth history?
a- Mesozoic b- Paleozoic c- Precambrian d- Cenozoic

2- When did reptiles dominate the earth?
a- Precambrian Eon b- Cenozoic Era c- Mesozoic Era d- Paleozoic Era

3- Which of the following eras is the oldest one?
a- Proterozoic b- Paleozoic c- Archaeozoic d- Azoic

4- Geologically, which came first?
a- appearance of flowering plants b- extinction of dinosaur
c- extinction of trilobites d- appearance of fish

5- Plants first appear on land during the ..... Period.
a- Cambrian b- Silurian c- Carboniferous d- Permian

6- Which of the following is not a terrestrial planet?
a- Earth b- Mars c- Venus d- Pluto

7- The group which shows a correct sequence of the geologic column is:.
a- Paleocene, Eocene, Oligocene b- Cambrian, Silurian, Ordovician,
c- Devonian, Permian, Carboniferous d- Jurassic, Cretaceous, Triassic

8- What was the source of rising oxygen levels in the Archean atmosphere?
a- volcanic outgassing b- photosynthesis by cyanobacteria
c- chemical weathering of iron oxides d- all the previous

9- Magnetic reversals describe the phenomenon of:
a- the reorientation of a rock within a magnetic field
b- the loss of the remnant magnetism from a rock with heating.
c- the change in mineral composition of a rock due to magnetism.
d- the periodic reversal of the polarity of the Earth's magnetic field.

10- The Cretaceous period is named for the abundant deposits of ..... that characterizes it.
a- coal deposited in swampy areas
b- chalk composed of the skeletons of calcareous fossils
c- gypsum deposited as evaporates in shallow seas
d- conglomerate deposited along stream channels

الورقة الرابعة

Second question: (5Marks)

1- Compare between: (3 Marks)
   a- The causes of Caledonian and Laramide orogenies. (2 Marks)
   b- The Permian and Triassic periods in their derivation of name. (1Mark)

2- Mark by using True (√) or False (X): (2 Marks)
   i- The earliest life was eukaryotes.
   ii- Epoch is the smaller divisions of the geologic time scale.
   iii- The Paleozoic Era can be known by the time of aggregation of continents.
   iv- The first fish appeared in the Mesozoic Era

Third question: (5 Marks)

Give reasons for two only of the following:

1- The formation of Red Sea.
2- The formation of Sierra Nevadan Mountains.
3- The accumulation of tellites sediments in South Africa during the early Paleozoic.

Fourth question: (5 Marks)

Write on two only of the following:

1- The evidences of life in the Archeozoic Era.
2- The causes of mass extinction at the Paleozoic/Mesozoic boundary.
3- Formation of the Tethys Ocean.

تمت الأسئلة مع أطيب الأمنيات بالتوفيق

ا.د/ مجدى صلاح محمود

ا.د/ ناجح عبدالرحمن عبيدالله

(1)

Geology Department Faculty of Sciences Assiut University		Second Term Examination Diagenesis & Marine Geology (305G) May, 2015 Two Hours

Part One: Diagenesis (25 Marks)

The first question: Answer the following: (14 Marks):

- Diagenesis processes (7 Marks)
- Factors affecting diagenesis (7 Marks)

The second question: (4 Marks)

Answer ONE only of the following:

- Diagenesis structures
- Stages of diagenesis

The third question: (4 Marks)

Answer FOUR only of the following:

Mark each statement as true (✓) or false (×) and correct the false ones:

- ( ) Temperature required for diagenesis is lower than 400 °C and pressure less than 1-3 kilobars.
- ( ) Mineral composition is an important factor controlling the diagenesis of sandstone reservoirs.
- ( ) Microbial activates are important diagenetic processes in carbonates and evaporates.
- ( ) Mesogenesis refers to the earlist stage of diagenesis.
- ( ) At higher temperatures and greater depths kaolinite is replaced by illite and chlorite.

The fourth question: (3 Marks)

What can we tell from diagenetic fluid inclusions?

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GOOD LUCK

Prof. Dr. Ezzat Abdallah Ahmed

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Part Two: Marine Geology (25 Marks)
Answer only three questions out of the following

Question No. (1). Choose the correct answer out of the following (8.25 Marks):
A. Turbidity currents are most likely to be found.....(4.25 Marks):
(1) where rivers empty into oceans. **(2)** on the continental slope.
(3) on the abyssal plains away from the continental rise.
(4) on the continental rise. **(5)** all the above.
B. Deep valleys eroded into the continental slope and shelf are called.....(4 Marks):
(1) estuaries. **(2)** submarine canyons.
(3) oceanic trenches. **(4)** abyssal valleys. **(5)** none of the above.

Question No. (2): Discuss and describe the following items (8.25 Marks):
A. Law of the sea (4 Marks). **B.** Continental shelves (4.25 Marks).

Question No.(3). Choose the correct answer out of the following (8.25 Marks):
A. Biogenous sediments are.....(4.25 Marks)
(1) they had long been thought to have been shed from meteors entering Earth's atmosphere.
(2) they form in the asteroid belt as sparks produced when asteroids collide. They then rain down on Earth as a general component of space dust.
(3) these deposits are formed by a chemical reaction that occurs within seawater.
(4) none of the above. **(5)** both (1) and (2). **(6)** all the above.
B. When a wave gets close to shore, water particles near the bottom move in ..... orbits (8.25 Marks):
(1) circular. **(2)** elliptical. **(3)** irregular. **(4)** rectangular. **(5)** all the above.

Question No. (4): Discuss in detail the subsea disposal of high-level nuclear waste (8.25 Marks).

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Good Luck **Dr. Abdalla El Ayyat**

Geology Department Faculty of Science Assiut University		Second-term final examination May 2015 Time: 2 hours

Subject: Sedimentary environments and basins (335G)
Students: 3rd level of Geology (Geochemistry) - May (2014-2015)
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Answer only <u>Ten</u> questions out of the following (50 marks)

1. Which type of sedimentary structure can be used to determine current direction in a sedimentary environment?
a. fossils and mud cracks. **b.** ripple marks and cross-bedding.
c. grain size sorting and ripple marks. **d.** mud cracks and ripple marks.
e. both (a) and (d). **f.** none of the above.

2. Which of the following processes is not an important cause of subsidence during the development of a sedimentary basin?
a. cooling and contraction of the crust. **b.** deposition of sediments.
c. erosion of sediments. **d.** tectonic down faulting.
e. both (a) and (d). **f.** none of the above.

3. Which of the following features in a sedimentary rock can be used to interpret its depositional environment (5 marks):
a. sedimentary structures. **b.** types of fossils.
c. the types of minerals (such as halite or gypsum).
d. the size, shape and surface texture of the sedimentary grains.
e. all of the above features. **f.** both (**a**) and (**b**). **g.** none of the above features.

4. True or False (5 marks):
a. a sedimentary basin is a high area in the Earth's crust, of tectonic origin, in which sediments accumulate.
b. basin modeling is a term broadly applied to a group of geological disciplines that can be used to analyze the formation and evolution of sedimentary basins.
c. back-stripping is a geophysical analysis technique used to quantitatively estimate the depth that the groundwater and petroleum would be in the absence of sediment and water loading.
d. in pre-depositional basins, rapid tectonic movements postdate significant sediment accumulation and create a morphological basin, which is filled later by post tectonic sediments.
e. sedimentary basins are separated from another by raised linear areas termed arches, paleohighs, schwelle, or positive areas.

5. Write briefly on the relationship between sedimentary environment and facies (5 marks).

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6. Discuss in detail the role of the thermal way in the formation of sedimentary basins on a regional scale (5 marks).

7. A sedimentary environment is defined as…….. ((5 marks)

a. a part of the earth's surface which could be distinguished from other parts by unique physical, chemical and biological parameters.

b. a sedimentary environment is the product of a depositional facies, a special kind of sedimentary environment.

c. a sedimentary environment is defined as any aerially restricted part of a designated stratigraphic unit which exhibits characters significantly different from those of other parts of the unit.

d. all the above. **e**. both (**a**) and (**c**). **f**. none of the above.

8. Basin analysis finds its greatest economic application in the fields of petroleum geology and hydrogeology. Discuss in detail the economic applications of basin analysis (5 marks).

9. Marine environments include all the following except…… (5 marks):

a. shelf **b**. submarine channel and fan. **c**. pelagic. **d**. coral reefs. **e**. fluviatile.

10. Write briefly on the following (5 marks):

a. trenches. **b**. pull-apart basins.

11. True or false (5 marks):

a. aulacogens are the second, failed arm of a three-armed rift, two of whose arms continued to open to form an ocean basin.

b. the chemical parameters of an environment include the velocity, direction, variation of wind, waves, and flowing water. They include the climate and weather of the environment in all their subtle variations of temperature, rainfall, snowfall and humidity.

c. one major goal of basin analysis is simply to develop a better understanding of Earth history as recorded in particular depositional basins.

d. the geometry of a sedimentary facies is a function of pre-depositional topography, the geomorphology of the depositional environment and its post-depositional history.

e. Pre-depositional sedimentary structures are those observed on bed interfaces which formed before deposition of the younger bed. They include channels, scour marks, flutes, grooves, tool markings, and a host of other erosional phenomena.

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Good Luck **Dr. Abdalla El Ayyat**

كلية العلـــوم-قسم
جامعة أسيوط
الجيولوجيا

امتحان طلاب المستوى الثاني (ساعات معتمدة)
مقرر (٣٤٠ ج) ميكانيكا الصخور وجيولوجيا تركيبية

يونيو ٢٠١٥ | الدرجة الكلية (٥٠ درجة) | الزمن : ٣ ساعات

PART I: ROCK MECHANICS *(20 marks)*

I- Answer the following questions:

1- Explain in details the stresses and their components developed along an inclined surface inside a body subjected to an effect of external forces (compression). *(**6** marks)*

2- Write about effect of the temperature, liquids and homogeneity of material on the deformability of geologic bodies. *(**6** marks)*

II-Answer **ONE** question **ONLY** of the following:

3- Compare between:

a. Confining pressures and angle of shear. (**2** *marks*)

b. Dilation and distortion. (**2** *marks*)

c. Pure and Simple Shear. (**2** *marks*)

d. Plastic dislocation and ruptures. (**2** *marks*)

4- Write briefly on:

a. Granular structures and plastic deformation.. (**2** *marks*)

b. Kinds of stress. (**2** *marks*)

c. The dependence of stresses in a rock on its porosity. (**2** *marks*)

d. Stress and strain ellipsoid. (**2** *marks*)

GOOD LUCK

Prof .Dr. A. R. El Younsy

(2)

PART II: STRUCTURAL GEOLOGY *(30 marks)*

Try to Illustrate your answers with suitable drawings when possible

ANSWER THE FOLLOWING FOUR QUESTIONS:

I. Choose the correct answer for the following statements and then rewrite in your answer paper (5 marks)

1- Parallel folds .....

a- inter-limb angles are equal.

b- the layer thickness parallel to the axial surface remains constant.

c-. maintain constant layer thickness across the folded surface.

2- The horizontal component of dip separation by a fault is called.....

Throw - Heave - dip slip

3- Secondary Non-tectonic geologic structures are classified into :

i)....., ii)....., iii)..... & iv).....

4- The angle of linear element with earth's surface in an imaginary vertical plane is called : .... (Plunge - Rake - Attitude)

5 - On a listric fault the hanging-wall block rotates around an axis that is .....

a- parallel to the fault surface b- perpendicular to the fault surface

c- oblique to the fault surface

II. A) Discuss the stress distribution in faulting. (6 marks)

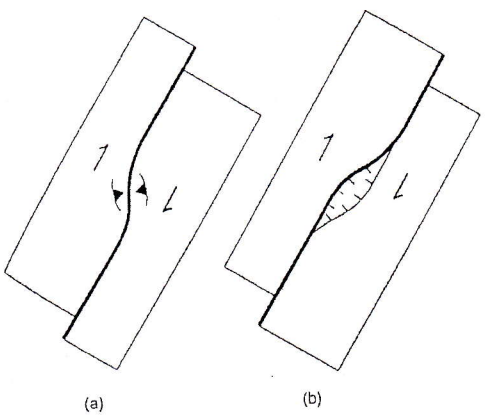
III. Using the figures below complete the following sentences and then rewrite in your answer paper: (8 marks)

A) Map-view illustrating (a) ....,

and (b) ....

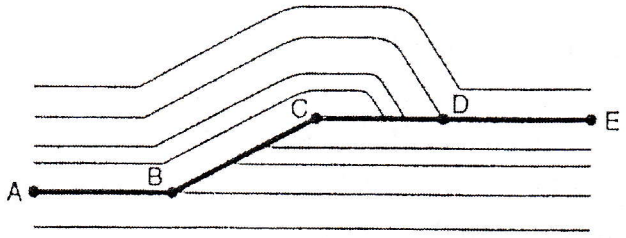
along a right- ....

(3 marks)



(a) (b)

(باقى الأسئلة فى الصفحة التالية)



B) Cross section illustrating how to describe hanging-wall and footwall flats and ramps.

Segment AB is ..... on..... .

Segment BC is .... on ....

Segment CD is .... on a .....-...../ .....

Segment DE is .... on a ....

(5 marks)

IV- Define and illustrate by drawings: **(5 marks)**

Kink folds – Monoclines - Half graben - Ptygmatic folds-

Flower structure .

ANSWER Only ONE OF THE FOLLOWING QUESTIONS:

V- Write a short article on Salt domes and their economic importance. **(6 marks)**

VI - Write short notes on **(6 marks)**

a- Field criteria of faults.
b- Parasitic folds

GOOD LUCK

Prof. Dr. Moustafa M. Youssef

Assiut University Faculty of Science Geology Department		June, 2015 Time: 2 hours

Final Exam on Geophysical exploration for oil and gas (351 PG)

Answer (SIX ONLY) of the following questions (with illustration as it is possible)

1- In seismic data acquisition, identified the different types of gathers.

2- Write about different types of seismic noise (Random and coherent)

3- Write briefly about diferent steps of seismc data processing.

4- Identify the normal moveout, and explane how it can be used to determine the seismic velocity.

5- Write about phase velocity, group velocity and RSM velocity

6- Explane the objective of Deconvolution

7- Define Zero phase wavelet, 45° phase wavelet, 90° phase wavelet, and Minimum phase wavelet.

8-

a) Explane how the seismic trace is formed using the seismic convolution model

b) Estimate the output response for convolution of the reflectivity sequence (1,0,1/2) with the source wavelet (1, -1/2).

9- Write on the reservoir impedance contrast and direct hydrocarbon indicators.

10- Measure the similarity or time alignment of the two traces wavelet 1: (2,1,-1,0,0) and wavelet 2: (0,0,2,1,-1) using crosscorrelation process and show how much the two time series resemble each other and determine the time lag at which they are mostly similar.

Examiner: **Prof. Dr Hamza A. Ibrahim.**

Prof. Dr Assem El-Haddad.

GOOD LUCK

Assiut University
Faculty of Science
Geology Department
Time allowed: Two hours

June 10th , 2015

Environmental Geochemistry G330

Final Exam

Answer on **Fourty questions** from the following
(Total points 50)
(each question worth one point)
Please answer on the same sheet do not use external paper

1) What are the **applications** of environmental geochemistry in your career?

2) What are the **tools** used in environmental geochemistry?

3) **Define** the open systems and closed systems in environmental geochemistry

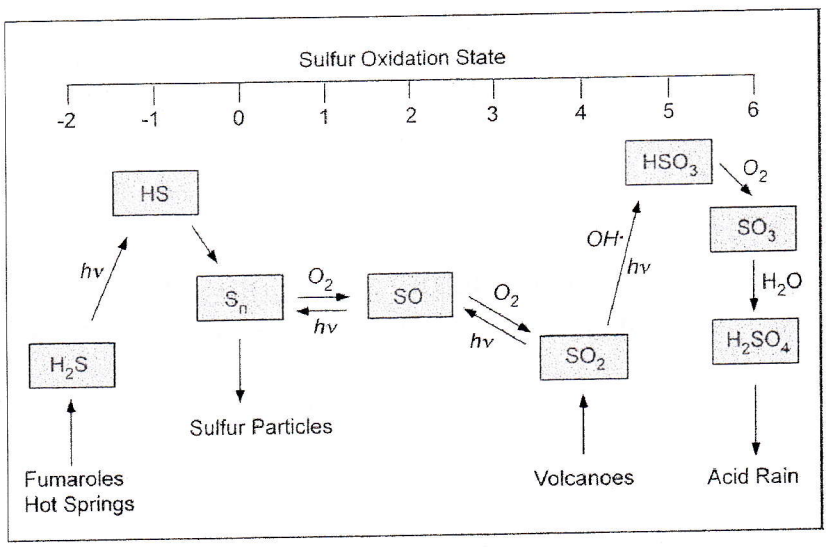
4) **Explain** the reversible and irreversible processes, giving examples for at least one of them

(2)

5) Biological processes are not like biological systems ? **Explain**

6) From the composition of the gases in the atmosphere of the planets: Venus, Earth and Mars do you expect to be a life on other planet than the earth? Why?

7) From the given figure, what is the oxidation state of Sulphur in hot springs, volcanoes and acid rain?



8) What is the chemical compound which catalyze the destruction of Ozone.When did the Ozone hole begin growing rapidly and how it is stabilized now?

9) What do we mean by **acid rain**. Explain using equations how it is formed.

10) What is the relation between photosynthesis , respiration , alkalinity and pH?

11) What caused anoxic conditions in Estuarine sediments?

12) Where you can find Autotrophic Organisms, what they do with the CO_2 in the environment. Give example for such organism.

13) Are the **nitrification** and **nitrogen fixation** processes the same ?

14) **Mention** some biolimiting nutrients you know

15) **Demonstrate** that we do not get seawater from river water

16) How **siliceous ooze** is formed in bottom sediments?

17) What is the role of reverse weathering and ion exchange in the clay mineral input to ocean sediments?

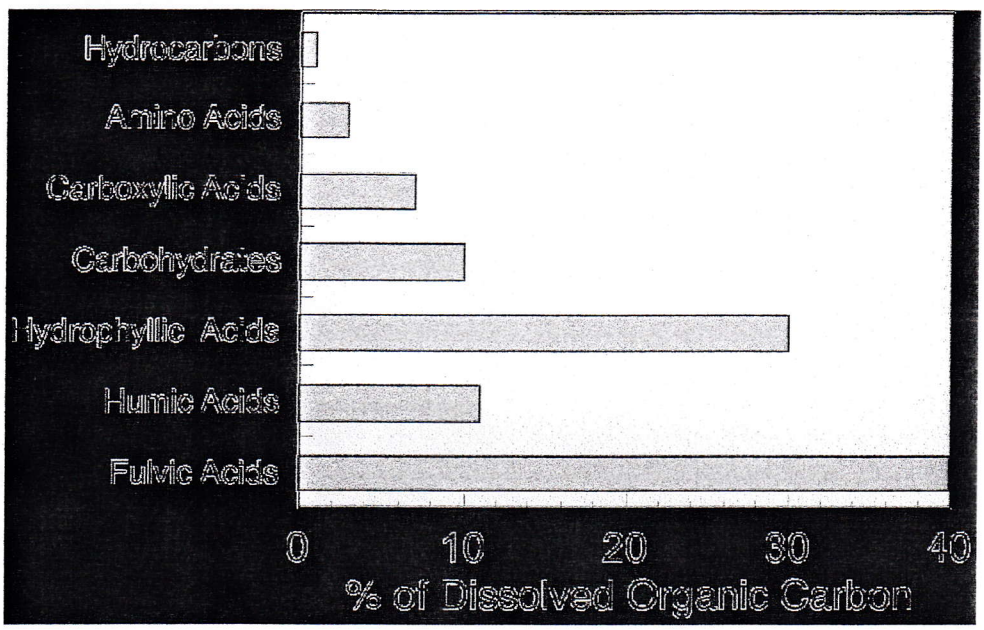
18) **Mention** the three groups of clay minerals ?

19) Where is located the closest hydrothermal vents to Egypt?

20) What are the most important biolimiting nutrients in the ferromanganese deposits in the Ocean and which percent they compose?

21) What is the Element Behavior in the Oceans?

22) What does this plot explain?



23) Write about the Nature of Humic / Fulvic Acids and Humin and their relations to pH.

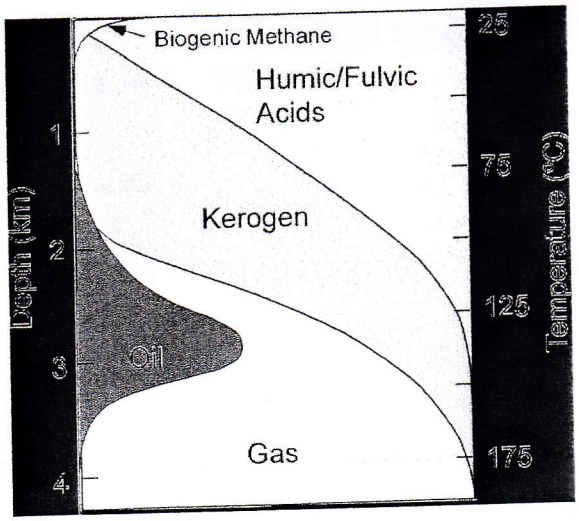
(6)

24) How much organic C in normal sediments? What is the redox conditions for accumulation?

25) Explain simply how kerogen is formed in sediments.

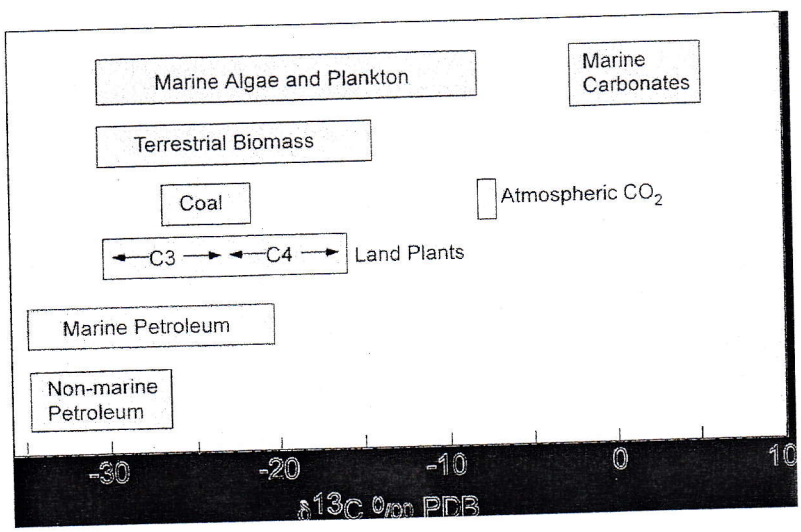
26) What is the relation between diagenesis, catagenesis and metagenesis?

27) What does this plot shows?



28) From the given plot , write down the values of carbon isotopes for the following :

marine carbonates =
marine algae and plankton=
coal =
marine petroleum =
non-marine petroleum=



29) **Summarize** the abiotic breakdown of biomolecules

30) What is meant by paleochemical record and what are the potential proxies used to define it?

31) Which isotopes are used to reconstruct past temperature.

32) Define the terms : thermocline,halocline and picnocline?

33) What happen to oxygen in shallow and deep oceans?

34) What are the causes of anoxic conditions and when do it take place in restricted basins?

35) What are the evidence of anoxic events in geologic history?

(9)

36) Write about Mo Isotopes and Marine Anoxia

37) What are the characteristics of marine evaporites basins

38) What is the role of chemical and isotopic proxies in paleoenvironment?

(10)

39) What are the processes recorded in evaporites and considered in the paleoenvironment.

40) Photosynthesis will increase alkalinity

a) True B) False

41) Oxygen isotopic fractionation during evaporation of seawater is greater in cold climates .

a) True b) False

- What regulates this criteria

42) Highly reactive elements have short residence times.

True B) False

43) What is the residence times of the water in the ocean? (Volume of Oceans (V_{ocean}) = 1.37 x 10^{21} L Global Riverine Input (F_{Riv}) = 3.6 x 10^{16} L/y)

(١)

جامعـــة أســـيوط
كلية العلوم - قسم الجيولوجيا

بســـم الله الـــرحمن الـــرحيم

امتحان التحريرى للمستوى الرابع بكلية العلوم شعبة جيولوجيا البترول

المادة: طباقية زمنية وحياتية (316ج ب)
(Chrono- and Bio-stratigraphy, 316GP)

الدرجة:50 درجة | دور يونيو 2015/2014م | الزمن: ساعاتان

(الامتحان فى صفحتين)

Answer the following questions:

السؤال الأول:(10 درجات)

Write the missing biozones and define the bioevents of the stage boundaries according to the below figure.

Time Units				Planktic Foraminiferal Biozones	Important bioevents of the stages boundaries
Era	Period	Epoch	Age		
Cenozoic	Paleogene	Eocene	Ypresian	*P. wilcoxensis/ M. velascoensis*	
		Paleocene	Selandian-Thanetian	*M. velascoensis*	
				G. pseudomenradii	
				M. angulata	←
			Danian		
				P. inconstans	
				G. cretacea	←
Mesozoic	Cretaceous		Maastrichtian		
				P. hariaensis	
				A. mayaroensis	
				G. aegyptiaca	
				R. hexacamerata	

السؤال الثانى: (10 درجات)

1- Remark by (x) or (√): (5 Marks)
   i- Various stratigraphic boundaries must be corresponding.
   ii- Geochronologic units consist of rocks and fossils.
   iii- All parts of rock strata have lithostratigraphic character.
   vi- Reworked fossils may use for biostratigraphic zonation.
   v- Concurrent-range zone characterizes by the abundance occurrence of one taxon.
2- Compare between of the following terms: (5 Marks)
   i- Acme and Assemblage zones.
   ii- Condensation and disconformity

السؤال الثالث: (10 درجات)

1- Tabulate the index fossils which are using in the biostratigraphy of Paleozoic Era. (5 Marks)

2- Define *three* only of the following concepts: (5 Marks)
Interzone - biofacies – biohorizon – index fossil

السؤال الرابع: (10 درجات)

Choose the correct answer: (one Mark for each)

1- The smallest formal unit of geologic time is…
a) an eon b) a period c) an era d) an epoch

2- The first form of life reach land is……
a) plant b) dinosaurs c) humans d) mammals

3- Which of these organisms existed first on Earth?
a) reptiles b) birds c) amphibians d) fishes

4- What characterizes of an index fossil?
a) abundant b- easily recognized
c) widely distributed geographically d) all of these

5- In the order of their occurrence, the following geologic time units from oldest to youngest are:
a) Proterozoic, Mesozoic, Paleozoic b) Paleozoic, Mesozoic, Proterozoic
c) Mesozoic, Paleozoic, Proterozoic c) Proterozoic, Paleozoic, Mesozoic

6- Of the following interval of geologic time, the most recent is the:
a) Miocene b) Eocene c) Cretaceous d) Pliocene

7- All of the following are periods of the Paleozoic, except…….
a) Cambrian b) Paleogene c) Permian d) Devonian

8- The collision of Laurentia with Baltica caused the ……. Orogeny during the late Silurian.
a) Laramide b) Caledonian c) Sonoma d) Hercynian

9- Dinosaurs became abundant during the ……..Era.
a) Paleozoic b) Mesozoic c) Proterozoic d) Cenozoic

10- Tillite is formed from
a) lake sediment b) river sediments c) marine sediments d) glacial deposits

السؤال الخامس: (10 درجات)

1- Write on *two* only of the following events: (6 Marks)
Ural Orogeny – Archean life – Mediterranean Salinity Crisis

2- Write the drivation of *four* only of the following: (4 Marks)
Permian - Devonian - Cretaceous – Triassic - proterozoic

تمت الأسئلة مع أطيب الأمنيات بالتوفيق

أ.د / ناجح عبد الرحمن عبيد الله **د /نصر احمد عبدالمقصود**

(1)

Geology Department Faculty of Sciences AssiutUniversity		Principles of Petrology June,3th2015 Three hours

Part I (Igneous and Metamorphic rocks)(32 Marks)

Answer the following question:

FIRST QUESTION

Correct the following paragraph (underline the correct word)(12 marks)

Modal analysis based on chemical composition is usually used to classify the plutonic rocks. This classification preliminary based whether quartz or feldspathoid mineral exists in the rock. The rocks composed of > 20% quartz and the alkali feldspar /plagioclase ratio < 0.1 are called diorite while the rocks formed of quartz < 5% quartz and the alkali feldspar /plagioclase ratio > 0.9 are called foidsyenite. The gabbroic rocks and diorites have the same mineral proportions, but they different only in the albite content of the plagioclase. However, when the rock is described as gabbroic rock, it should be subjected to a further classification based on the proportion of plagioclase, olivine and pyroxene minerals. When the gabbroic rock composed mainly of olivine and plagioclase, the rock is called norite while when they composed mainly of plagioclase and orthopyroxene, the rocks is called gabbronorite. On the other hand, when the rock formed of < 10% plagioclase and > 90% olivine and pyroxene minerals, the rock is classified as ultramafic rocks and a further classification based on the proportion of olivine, orthopyroxene and clinopyroxene should be used. The ultramfic rocks formed of > 90% olivine are calledperidotites, while those formed 40% -90% olivine are called dunites. Anyhow, the predotite rocks are main rock type in the earth crust and can be distinguished based on their orthopyroxene/ clinopyroxene ratios into three types: wehrlites, lherzolites and herzburgites. The presence harzburgite in the mantle source means that source has subjected to partial melting led to exhaust orthopyroxene, whereas the presence dunite in the melting source means that source has subjected to higher degrees of melting led to exhausted clinopyroxene and olivine. Finally, the presence wehrlites in the melting source means that source has subjected to metamorphism.

==========

Answer only TWO questions from the following:

SECOND QUESTION (10 marks)

Mention inPOINTS:

(1) Tools used for studying igneous and metamorphic rocks!

(2) Type of melt-melt differentiation!
(3) Source of heat during metamorphism!
(4) Subsolidus transformation in the mantle!
(5) Identification of melting degree from mineral proportions in the mantle rocks !
(6) Tools used for identification of Moho discontinuity!
(7) Pyrolites!
(8) Characters of the primary melts.
(9) Foliations in the metamorphic rocks!
(10)Hornfelsrocks!

THIRD QUESTION (10 marks)

Compare in<u>TABLE</u> between:

(1) Lithostatic pressure–directive pressure!
(2) Cataclastic rocks andhornfels rocks!
(3) Batch and Fractional melting!
(4) Compatible and incompatible elements!
(5) Amphibolites-Green shist!
(6) lithosphere and asthenosphere!
(7) Pumiceous and coraceous rocks!
(8) Aphyric and porphyritic textures!
(9) Spherolitic and corona textures!
(10)Microprobe analyses and ICP-MS analyses!

FOURTH QUESTION (10 marks)

Explain <u>Why</u>:

(1) The fraction crystallization plays important role in the magma differentiation!
(2) Modal composition is usually used in nomenclature of plutonic rocks whereas chemical composition is commonly used in nomenclature of the volcanic rocks!
(3) The rate of cooling plays the essential role in the texture of the igneous rocks!
(4) Melts produced by batch melting mechanism is usually less enriched in incompatible elements compared to those produced by fractional melting!
(5) Gas transfer in the magma chamber plays an important roles in the diversity of igneous rocks !

SEDIMENTARY R.

Choose or complete the correct answer for the following: (one mark each)

1. Factors which control the composition of sedimentary rocks are
   a-
   b-
   c-
   d-

2. Subkhas are located behind
   a-Shore line.
   b-Shore face.
   c-Shallow shelvies.
   d-Lagoon.

3. Bathyol abyssal environment is located
   a-Out of the continental margin.
   b-Inside the eperic sea zone.
   c-Directly beside the barriers.
   d-Within the open marine zone.

4. Permeability is the
   a-Percentage of porespace.
   b-Percentage of interconnected porespace.
   c-Effective porosity.
   d-Ability to transmit solutions.

5. Calm marine water are simply
   a-At the sea level.
   b-Under the sea level.
   c-Under the wave base.
   d-Above the wave base.

6. Terrigeneous sediments study is concerned with
   a-Texture of sediments.
   b-Mudstone sediments.
   c-Structure of sediments.
   d-Siltstone sediments.

7. Epiclastic texture dealts mainly with
   a-
   b-
   c-

8.Consolidated silt and clay is called

a-Siltstone and claystone.
b-Fine grained sediments.
c-Mudsone.
d-All the above.

9.The main subclass of grade scale sediments are

a- (to mm)
b- (to mm)
c- (to mm)
d- (to mm)
e- (to mm)

10.There are four aspects of grain morphology

a-
b-
c-
d-

11.The ratio of grain surface area to a sphere surface area which have the same size of grains is

a-Roundness.
b-Practical sphericity.
c-Theoritical sphericity.
d-Maximum projection spherity.

12.The outside appearance of grain and its outer impact marks dealt mainly with

a-Orientation.
b-Grain shape.
b-Grain surface texture.
d-Sphericity.

13.Write only one surface texture for the following sands

a-Beach sand often show:
b-Desert sand often show:
c-Glacial sand often show:
d-River sand often show:

14.Draw the flow direction and grain orientation of
a-Imbrication

b-Preferred orientation

c-Normal to the current

d-Non-imbrication

15.Minor components of terrigeneous sediments are
a-Detrital matrix.
b-Chemical cement.
c-Detrital grains less than 1\16 mm.
d-All of the above.

Mark at the end of each sentence:Right (√) or False (X) : (one mark each)

1.Sedimentology is the science studying the morphology of sedimentary rocks. ( )

2.Usually the all subsurface sedimentary rocks are rich with water, petroleum and gas. ( )

3.The depositional processes includes the natural processes affected with air , wave and currents. ( )

4.Lake environments must be near the rivers and near the beach areas. ( )

5.Continental rise environment is one of the continental environment group. ( )

6.Agitated marine water is only above the sea level. ( )

7.Intrabasional epiclastics more or less deposited within the depositional basins. ( )

8.Epiclastic texture reflects the weathering, erosion, transition and deposition. ( )

9.Arenite sediments subdivided into sand and granules. ( )

10.Grade scale is more or less valiable in subdivided the intra and extra formational clasts. ( )

11.The consolidated leutite sediments may be easy call mudstone. ( )

12.Sieving analysis may be measure the grain sizes of arenite sand and arenite limestone. ( )

13.Maximum projection sphericity is how closely the grain shape approaches that of a sphere. ( )

14.There are four classes of grain shape and two classes of roundness and six classes of sphericity. ( )

15.Crescentic impact marks occure on pebbles from beaches and rivers. ( )

بسم الله الرحمن الرحيـــم

University of Assiut
Faculty of Science
Department of Geology

3rd Level Examination for Geology, Geophysics and Geochemistry students
In Field Geology (306G)

Time: Two Hours **50 Marks** **May, 2015**

ملحوظة هامة: الأمتحان يتكون من صفحتين

Answer the following question:

1- First Question (10 Marks)

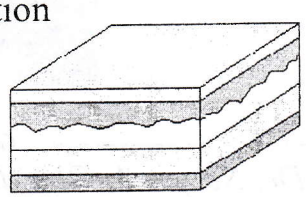
i- Choose the correct answer: (5 Marks, one Mark for each)

a- Graded bed can be formed in ..... Environment.
a- Stream b- lacustrine c- tempestites d- Eolian

b- Field work include sampling of rock types for .....
a- elemental analysis b- geochronology
c- fossil identifications d- all of these

c- Only one instrument do not use for measuring the angles in a traverse
a- compass b- chain c- theodolite d- total station

d- The figure at the right hand side shows .....
a- paraconformity b- angular unconformity
c- nonconformity d- disconformity



e- Which of the following can be used to determine paleocurrent direction
a- mud cracks b- grain size c- cross bedding d- turbidity currents

ii- Compare between the general features of igneous and sedimentary rocks. (5 Marks)

2- Second Question (10 Marks)

Summarize the contact boundaries between the different rocks unitsillustrating your answer by drawing.

3- Third Questioin (10 Marks)

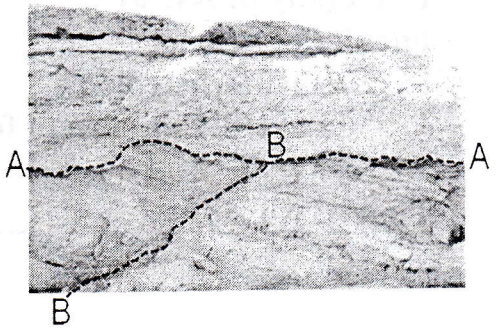
i- Write on ***one only*** of the following: (5 Marks)
a- The filed criteria of faults.
b- Tools and equipments of the geological field mapping.

ii- Define the following concepts: pillow lava - ripple marks (5 Marks)

4- Fourth Question (10 Marks)

Redraw the field photograph at the right hand side, then answer the following questions:

a- The line A-A represents .....
b- The line B-B represents.....
c- Interpret in a brief report the geologic history of the field photograph.



5- Fifth Question (10 Marks)

i- Discuss the stratigraphic-cross section, illustrate your answer by drawing. (5 Marks)

ii- Look at the underlying field photograph, then describe and interpret its origin. (5 Marks)

---------- ***GOOD LUCK*** ----------

Prof. Dr. Nageh A. Obaidalla

Assiut University
Faculty of Science
Geology Department

جامعـــــة أسيـــــوط
كلية العلوم - قسم الجيولوجيا

2nd Semester Final Written Exam, 2015
for Petroleum Geology Students

Course: **Organic Geochemistry, PG332** Time Allowed: **2 Hours**

1- State whether the following statements are correct or wrong and correct the wrong one (10 marks; 2 marks each):

A- Gas hydrates formed at low gas pressure and temperature.
B- Carboxyl groups attached to hydrocarbon chains form fatty acids.
C- S_2 (mg HC/g rock) is a more realistic measure of source rock potential than TOC wt%, because TOC includes "dead carbon" incapable of generating petroleum.
D- Coal-bed methane like conventional NG, is trapped in pore spaces of rocks.
E- Evolution of hydrocarbons with increasing depth of burial within the upper crust is principally controlled by pressure.

2- Define FIVE ONLY of the following (10 marks; 2 marks each):

a- Hydrocarbons, b- Reactive kerogen, c- T_{max}, d- Net primary productionc, e- Oil window, f- Pyrolysis, g- Source rocks.

3- Choose the correct answer: (10 marks; 2 marks each)

A- In the late phase of metagenesis, the cracking zone refers to the generation of:
1- Dry gas 2- Wet and dry gas 3- light oil and dry gas 4- All of them

B- In organic geochemistry, diagenesis is applied to processes affecting products of primary production prior to deposition and during early stages of burial under:
1- High temperature and pressure 2- Low temperature and pressure
3- Low temperature and high pressure 4- High temperature and low pressure

C- Aerobic decomposition of particulate organic matter in sediment depends on:
1- Rate of burial 2- Amount of oxygen present at the sediment surface
3- Rate of burial and high temperature 4- Both rate of burial and amount of oxygen

D- General controls that may affect photosynthesis include:
1- Light 2- Water 3- Temperature 4- Salinity 5- All of them

E- In a source rock evaluation for HC potential, key analyses that have to be carried out are:
1- Type and maturation of OM, and burial history of the basin
2- Maturation of OM, burial history of the basin, and timing of HC generation
3- Burial, tectonic, and thermal history of the basin, and timing of HC generation
4- Amount, type, and maturation of OM

4- Write briefly on FOUR ONLY of the following (20 marks; 5 marks each):

A- Types of kerogen.
B- General conditions for formation of organic-rich sediments.
C- Methods of determination of thermal maturation of organic matter.
D- Types of unconventional natural gas.
E- Process of hydrocarbon generation.

Dr. Amr S. Deaf *Good Luck*

Assiut University
Faculty of Science
Geology Department

Date: 7/6/2015
Time: 2 hours

Special Course 305 G (Ophiolite)

Answer three questions only <u>starting with the first one</u> (Use drawing when possible):

1- Compare and contrast the evolution of the Andes and the Himalaya mountain ranges. **(20 marks)**

2- Compare between the evolution of plate margins and aulacogens. **(15 marks)**

3- Summarize the different models for the formation of continental rifts. **(15 marks)**

4- Write short notes **only on three** items of the followings:
   a. Differences between continental and oceanic crust. **(5 marks)**
   b. Main structural elements forming the forearc regions. **(5 marks)**
   c. Evolution of marginal seas. **(5 marks)**
   d. Seismic structure of the mantle. **(5 marks)**
   e. Mélanges. **(5 marks)**

Good Luck,,,

Prof. Dr./ Ali A. Khudeir

Assiut University
Faculty of Science
Geology Department

Date: 7/6/2015
Time: 2 hours

Principles of Structural Geology (345 G)

Answer three questions only <u>starting with the first one</u> (Use drawing when possible):

1- Summarize briefly the different geometrical classifications of faults.

(20 marks)

2- Compare between **three** of the following structural pairs:
   a. Parallel folding - similar folding. **(5 marks)**
   b. Chevron folds – kink bands. **(5 marks)**
   c. Translation gliding – twin gliding. **(5 marks)**
   d. Rake – plunge. **(5 marks)**

3- Outline the essential bases of classification of folds.

(15 marks)

4- Write short notes on the evidence of strain in a sedimentary sequence.

(15 marks)

Good Luck,,,

Prof. Dr./ Ali A. Khudeir

Assiut University **Date: June, 2015**

Faculty of science **Time allowed: 2 hours**

Geology Department

Final Examination

Subject: Course No. G 336(metamorphic rocks)

Students: 3rd year Geology (credit system)

Figures must be drawn whenever possible:-

Answer this question: - (20 Marks)

A – Heating of the country rocks adjacent to various intrusions at depths of 6 km and 1.2 km – what are the geological facts that can be concluded from the binary relation between temperature and pressure at these depths?

B –Various intrusions of igneous magma penetrated unmetamorphosed shale at depth 5 km where the temperature of the country rocks was 100° C.

1- **Calculate the temperature at these distances- 100, 200, and 500 meters if the thicknesses of these intrusions are one km?**
2- **What are the types of metamorphic rocks at these distances?**

Answer TWO only of the following questions:-

1- **A- What is contact metamorphism and how can it be distinguished from regional metamorphism? (7 Marks)**

B- Two different metamorphic rocks could form under exactly the same metamorphic conditions -Explain? (8 Marks)

2- **A- When preexisting rocks are exposed to conditions of high temperature and/or pressure they undergo solid – state changes, what are the main changes that will occur? (5 Marks)**

B- Select the true answer (s) and correct the false answer (s) for each of the following sentences?

(10 Marks)

- Migmatite can be considering gradational between an igneous rock and a metamorphic rock.
- Metasomatism is the process where rocks previously metamorphosed under high-grade condition.
- Porphyroblastic texture is the most important textural feature of regional metamorphic rocks.
- Confining pressure is the appropriate pressure that response in the alignment of metamorphic minerals.
- Within a 50 km traverse you walk from a shale into a slate into a phyllite. You are walking in the direction of increasing contact metamorphism.

3- A- What are the differences between slates that affected by progressive metamorphism (i.e. hydrothermal and thermal types).

(6 Marks)

B- Metamorphic zones of different metamorphic grades are characterized by the appearance of distinctive index mineral. By mineral reaction equations explain the conditions of formation of these mineral indices in metapelites. (9 Marks)

GOOD LUCK