



Time: 2 hours	Total marks: 50	GPR and Paleomagnetism (G453)	January, 2018
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Answer the following first and second questions:

1. Fill in the blankets.

(17 marks)

- 1) Spinner magnetometers so named because they The magnetization along a given axis is measured by detecting the
- 2) Acquisition of induced magnetization is a without memory of past magnetic fields.
- 3) is the time required for the remanence to decay.
- 4) At in a magnetic field, the grain magnetic moment is "blocked" along the easy axis that is closest to the direction of the field at that time.
- 5) The effect of high hydrostatic pressure is to deflect the magnetizations of individual grains away from existing easy axes, which leads to a of the rock.
- 6) The basis for alternating field (AF) demagnetization is that
- 7) In thermal demagnetization, there is no field being applied and so after going through the oven, only grains with retain magnetization.
- 8) CRM is most often encountered in sedimentary rocks; most commonly, weathering of rocks will produce the hydrated minerals like and can oxidize magnetite to
- 9) During progressive chemical demagnetization techniques, remaining NRM does not change in but decreases in
- 10) The fold test (also known as a tilt test) relies on the
- 11) If processes of weathering associated with conglomerate formation have resulted in alteration of the ferromagnetic minerals, the conglomerate test can be even when the source rock contains a stable
- 12) At all locations, the time-averaged geomagnetic field directions during a normal-polarity interval and during a reversed-polarity interval differ by°. This property of the geomagnetic field is the basis for the of paleomagnetic stability.
- 13) If a paleomagnetic data set "....." the average directions for the normal and reversed polarity sites differ by an angle that is significantly less than 180°.
- 14) Passage of the reversals test indicates that ChRM directions are free of and that the time sampling afforded by the set of paleomagnetic data has adequately averaged
- 15) Time intervals of geomagnetic polarity are now referred to by a designation that is tied to the marine magnetic anomaly numbering system.
- 16) The (frequency- dependent) properties that control the behavior of electromagnetic energy in a medium are a)....., b), and c).....
- 17) The presence of iron and iron oxides can enhance the significantly.
- 18) The relative permittivity plays an important role in both and of electromagnetic waves. The relative permittivity of sediment is governed by its
- 19) When a propagating electromagnetic wave encounters a discontinuity in electric, magnetic or conductive properties, part of the electromagnetic energy is reflected, the reflection strength being proportional to the between different layers.
- 20) The primary effect of conductivity on electromagnetic waves is The GPR is ineffective in materials such as those under or with high
- 21) Zero-offset profiling (ZOP) uses a configuration where the transmitter and receiver are resulting in parallel ray paths in the case of homogeneous subsurface media.

Please Turn Over →

2. Put (True) or (False) at each point, and correct the (false) if present.

(17)

- 1) In Geocentric axial dipole (GAD), the magnetic field produced by a single magnetic dipole at the center of the Earth and aligned with the natural remanent magnetization.
- 2) Magnetic remanence or spontaneous magnetization is caused by strong interactions between neighboring spins that occur in certain crystals.
- 3) Thermoremanent magnetism (TRM) is NRM produced by cooling from below the blocking temperature in the presence of a magnetic field. TRM is the form of remanent magnetism acquired by most igneous rocks.
- 4) At surface temperatures, thermoremanent magnetism can be stable over geologic time and resistant to effects of magnetic fields after original cooling.
- 5) On cooling through the Curie temperature the magnetic state of magnetite grains changes from paramagnetism to diamagnetism.
- 6) The fundamental principle that underlies demagnetization techniques is that the higher the relaxation time, the less likely the grain will carry a secondary magnetization.
- 7) The basis for thermal demagnetization is that these grains also have low blocking temperatures.
- 8) The baked contact test now provides evidence that the magnetization of the unheated sediment has been stable at least since the time of the intrusion. This is referred to as the conglomerate contact test.
- 9) The ratio of depositional to postdepositional alignment depends upon: a) Grain size, b) Rate of deposition, c) Bioturbation.
- 10) The Characteristic remanent magnetization (ChRM) directions are said to "fail the fold test" if clustering increases through application of the structural correction or "pass the fold test" if the ChRM directions become more scattered.
- 11) If ChRM in clasts from a conglomerate has been stable since before deposition of the conglomerate, ChRM directions from numerous cobbles or boulders should be randomly distributed (=failure of conglomerate test). A nonrandom distribution indicates that ChRM was formed after deposition of the conglomerate (=passage of conglomerate test).
- 12) Failure of the baked contact test can indicate either (1) presence of an unremoved secondary NRM component or (2) inadequate sampling of geomagnetic secular variation during either (or both) of the polarity intervals.
- 13) ChRM directions are said to "fail the reversals test" if the mean direction computed from the normal-polarity sites is antiparallel to the mean direction for the reversed-polarity sites.
- 14) Failure of a conglomerate test thus provides strong evidence for stability, whereas passage of the test is certainly a warning, but not necessarily a clear indication that the ChRM of the source rock is secondary.
- 15) The technique of ground-penetrating radar (GPR) is based on propagation and reflection of electromagnetic energy in the subsurface.
- 16) For most geological materials, the relative magnetic permeability (μ_r) is near unity. Consequently, the magnetic permeability in the subsurface is near the free-space value (μ_0) and plays a role in the electromagnetic energy behavior.
- 17) In most natural low-loss material such as clean sand, the influence of dielectric constant on the electromagnetic signal is negligible between 100 and 1000.
- 18) For homogeneous sediments with impedance contrasts, attenuation of electromagnetic signals is governed by σ and ϵ_r . In low-loss material, the original pulse amplitude (A_0) increases exponentially with depth (z) according to $A = A_0 e^{-\alpha z}$, where the attenuation constant $\alpha = 0.5\sigma \sqrt{\mu/\epsilon}$.
- 19) Permittivity describes the ability of a material to store and release electromagnetic energy in the form of electric charge and is classically related to the storage ability of capacitors. Permittivity greatly influences the electromagnetic wave propagation in terms of velocity.
- 20) In a common midpoint survey, a separate transmitter and receiver are placed on the ground. The separation between the antennas is varied, keeping the center position of the antennas constant.
- 21) In a common-offset survey, a transmitter and receiver are placed with a fixed spacing. The transmitter and receiver scan the survey area, keeping the spacing constant and acquiring the data at each measurement location.

Please Turn Over →

Answer the third OR the fourth question ONLY:

(8 marks)

3. In the baked contact test, compare in detail the magnetic variations in the gradational zones outside the igneous body for the possible cases of:
- a- High stability sediments much older in age
 - b- Stable igneous rocks much older in age
 - c- Sediments of similar age
4. Illustrate the alternating field demagnetization process

Answer the fifth and sixth following questions:

(8 marks)

5. In a table format, illustrate the different relationships between the GPR parameters and dielectric constant, electric conductivity, and transmitter frequency.
6. Illustrate the parameters used to define any reflection survey design.

End of questions

GOOD LUCK

Dr. Mostafa Thabet Mohammed



Ore Microscopy and Ore Petrology (431 G)

Answer TEN only of the following:

Note : 5 marks for each question

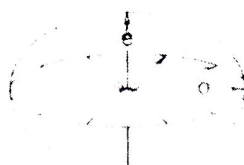
1. Identify bireflectance and reflection pleochroism? Which minerals of the following have pleochroism and why?
Pyrite-molybdenite- magnetite, covellite, graphite
2. Discuss briefly the genesis of chromite and VMS.
3. Under microscope, when light penetrate deep below the surface of the polished sample and to be reflected back to observer from cracks and flaws within the crystal as diffuse light area.
a) What is the name of this feature?
b) What the reasons which lead to this feature caused?
4. What are similarities and differences between SEDEX and MVT deposits?
5. Look to the figure and then answer



(a)



(b)



(c)

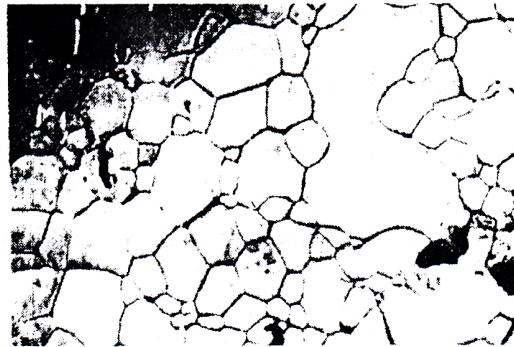
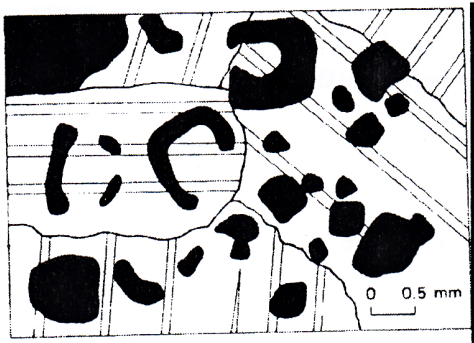
- a) The optical indicatrix for..... And is the n_e is $< - >$ or $=$ no
 - b) The optical indicatrix for And is the n_e is $< - >$ or $=$ no
 - c) The optical indicatrix for And is the n_e is $< - >$ or $=$ no
6. Write the steps of formation the magmatic Cu-Ni, and PGE deposits.
 7. Replacement textures may be caused as a result of
1....., 2....., 3.....
 8. Which type of the deposits form concordant or discordant of the following :
Sulphides in lime stone-mineralized quartz veins – Stockwork - VMS- Chromite in basic and ultrabasic rocks.
 9. Discuss briefly the model of porphyry type deposit

LOOK TO BACK

10. Look to the photos and then answer

a. Oxide minerals in basic rocks

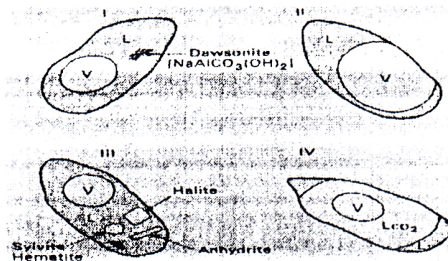
b. sulphides in basic rocks



a. Write texture name of (a) and (b)

b. What is the time relation between silicates and both the oxides and sulphides

11. Write the types of fluid inclusions in the following photo based on their composition



With my best wishes

Mohamed Abdel Moneim

بسم الله الرحمن الرحيم

جامعة أسيوط
كلية العلوم
قسم الجيولوجيا

Assiut University
Faculty of Science
Geology Department

إمتحان المستوى الرابع (شعبة جيولوجيا البترول)
مقرر 405 ج ب (جيولوجية مصر والإحتمالات البترولية)

Course 405 PG (Geology of Egypt)

الزمن : ساعتان

الدرجة: 50 درجة

دور يناير 2018

الإمتحان في أربع صفحات

Part I (PreCambrian) 10 Marks

Question 1:

Write on ONE of the following items: (10 Marks)

1-A: Write short notes on the main lithologic units pertaining to the Metasaharan Craton occurring in the Western Desert of Egypt. (10 Marks)

1-B: The characteristic features of the Egyptian ophiolites. (10 Marks)

Part II (Cambrian to L. Cretaceous) 10 Marks

Question 2 (A-C):

Write on the following items: (10 Marks)

2-A) Write on the Carboniferous sediments in Egypt. (6 Marks)

2-B) Give reasons for only TWO of the following: (4 Marks)

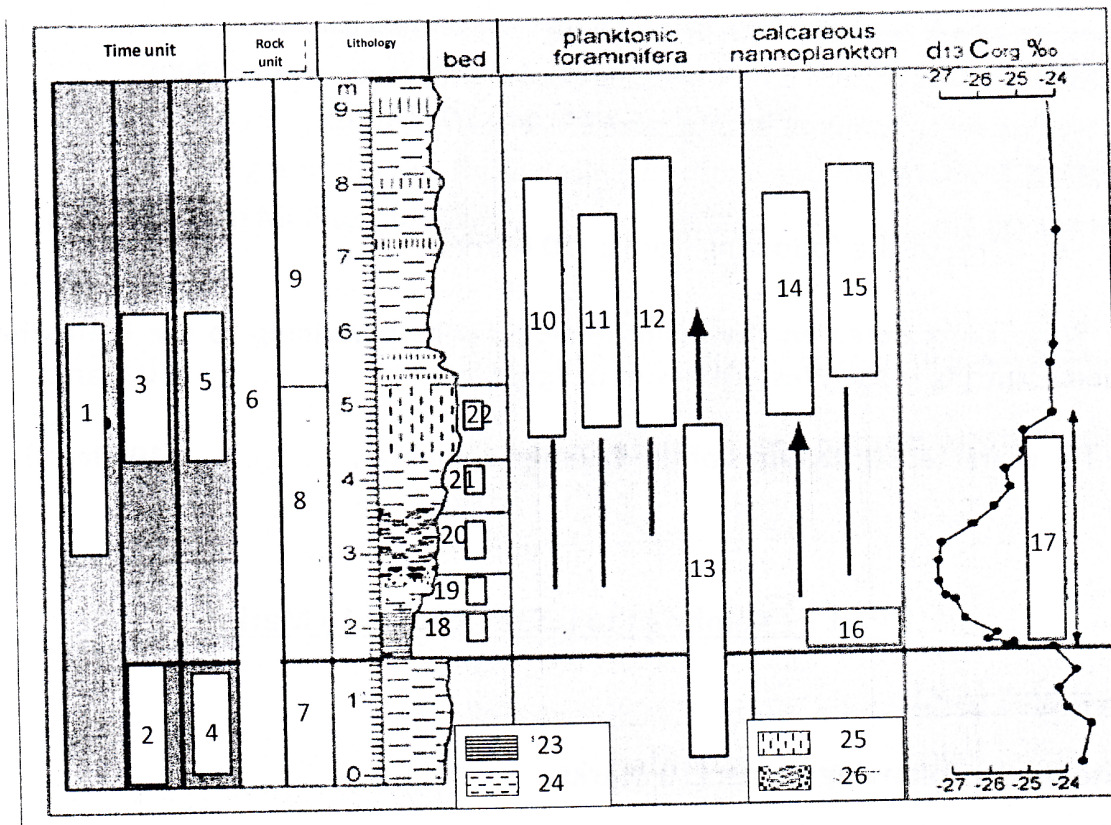
- The variations in the thickness of the Paleozoic sediments in Egypt. (2 Marks)
- The difficulty in the differentiation of the Paleozoic sequences at Gilf El Kebir Plateau. (2 Marks)
- The restricted occurrence of Paleozoic deposits in Egypt. (2 Marks)

Part III (Upper Cretaceous to Quaternary) 20 Marks

Answer TWO Questions of the following:

Question 3: (10 Marks)

If you know in the following table that No. 2 is the Paleocene Epoch and No. 3 is the Eocene Epoch in the GSSP of the P/E boundary, please identify the type locality of this boundary, and fill the remaining white spaces from 1 to 26 in the given table by appropriate litho- , chemo- and chronostratigraphic terms as well as characteristic bioevents which mark the this boundary. (10 Marks)



Question 4:

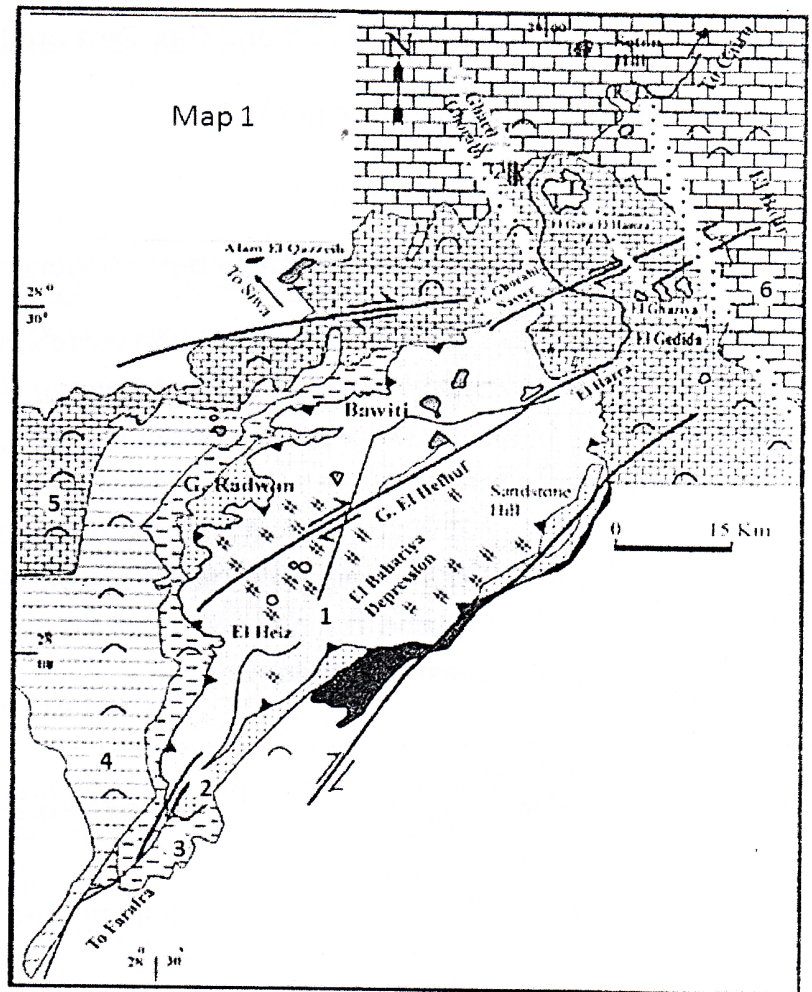
4: Correlate stratigraphically the Middle-Upper Eocene rock units in Fayoum , Cairo and Sinai. (10 Marks)

Question 5 (A-B): (5 Marks)

5-A: Look to the adjacent map (Map 1) and define:

i-The name of district

ii-The names of rock units and their equivalent ages which are given from 1 to 6.



5-B: Select from list B the equivalent rock units to those of list A.

(5 Marks)

List A

Kiseiba Formation
Belayim Formation
Garra Formation
Dabaa Formation
Birket Qarun Formation
Mamura Formation
Ryan Formation
Qawasim Formtion
Bir El Tamsah Formation
Kareem Formation

List B

Mokattam Formation
Rudeis Formation
Um Mahara Formation
Quseir-Duwi-Dakhla
Syatin Formation
Tarawan Formation-Hanadi Member
Observatory Formation
El Qurn-Wadi Garawi Formations
Belayim –South Gharib Formations
Geisum Formation
Qasr El Sagha – Qattrani Formations
Darat-Khaboba Formations

Part IV (Oil and Gas Potentialities in Egypt) 10 Marks

Answer the following question:

Question 6 : (10 Marks)

6: Give the appropriate data on the following items:

- i- The reserves by age and petroleum system in the Gulf of Suez and Western Desert of Egypt (2 Marks)
- ii- The difference between crude oil, natural gas and condensates (1 Mark)
- iii- The total world reserves of crude oil and natural gas at the beginning of 2008; how much of these reserves occur in the Middle east (2 Marks)
- iv- The source rocks, reservoirs and estimates of volumes of undiscovered oil and gas in the Nile Delta Basin (Nile Cone and Nile Margin) in the eastern Mediterranean. (5 marks)

Good Luck.

Prof. Khaled Ouda; Prof. Ali Khudeir; Prof. Nageh Obaidalla

Faculty of Science
Geology Department
Time allowed: 60 minutes

December 18th, 2017

Final Exam

Geochemistry G433

Time allowed: 60 minutes

Each question worth one point

No. of Pages 4 - 26 questions

Part One

Multiple choices

Answer five questions only from this part

1) The composition of the oceanic crust is

- a- Peridotite
- b- granodiorite
- c- basalt
- d- ophiolite suite

2) The composition of the Upper mantle

- a- Peridotite
- b- granodiorite
- c- basalt
- d- ophiolite suite

3) This part of the core is liquid

- a- the inner core
- b- the outer core
- c- both

4) the layer of the earth where the movement of the earth's plates take place is called

- a- Lithosphere
- b- Asthenosphere
- c- Mantle

d- None of the above

5) The formation of minerals in the igneous rocks is controlled by

a- the chemical composition of the magma

b- the physical- chemical conditions during crystallization.

c- both

d- none of the above

6) In Rock classification these factors are important

a- Texture & mineralogy

b- chemistry & geographic location

c- rock associations

d- none of the above

e- all the above

Part Two

True or False

7) The continental crust is thicker than or the oceanic crust?

a) True

b- False

8) The Upper Mantle has a Low Velocity Layer

a) True

b- False

9) The whole-rock chemistry) and the chemistry of the constituting minerals give clues to igneous rock origins

a) True

b- False

10) Pegmatite is a compositional term

a) True

b- False

Part Three

Fill in the spaces

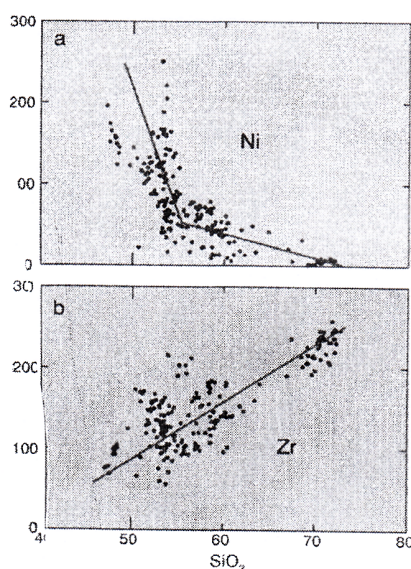
11) The basic system which classifies rocks on the basis of where they form is called Why this classification is not very practical

- 12) This ----- classification gained application in igneous rocks
- 13) The chemical analyses of igneous rocks include a major analyses of 12 elements because -----
- 14) The percentage the total of the igneous rock analysis should sum to 100 %, ideally, however acceptable totals are
- 15) Those two minerals ----- form at high temperatures on the Bowen Reaction Series on the continuous and discontinuous series
- 16) This element ----- substitutes for ca-plagioclase

Part Four

Comment on the following

- 18) Why the felsic rocks are light colored?
- 19) Which techniques are used In the routine geochemical analysis of geological materials
- 20) The major, minor and trace elements and their values in igneous rocks
- 21') Explain what happens to the trace element (Ni and Zr) with the variation of the Silica content in he given diagram



22) The three types of trace elements substitution

23) Compatible elements

24) How to quantify the distribution of trace elements into minerals/rocks

25) When Camouflage takes place?

26) When Capture occurs? giving examples

بسم الله الرحمن الرحيم

جامعة أسيوط
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Assiut University
Faculty of science
Geology Department

إمتحان المستوى الرابع (شعبتي الجيولوجيا والجيوفيزياء)

مقرر 415 ج (جيولوجية مصر)

Course 415 G (Geology of Egypt)

الزمن ثلاث ساعات

الدرجة: 50 درجة

دور يناير 2018

الإمتحان مكون من أربعة صفحات

Part I (PreCambrian) 10 Marks

Answer only ONE question of the following using drawing when possible:

Question 1-A : (10 Marks)

Summing-up the successive stages illustrating the development of the Precambrian Basement in the Arabian-Nubian Shield.

Question 1-B : (10 Marks)

Compare and contrast between the lithologic sequence in the Meating dome and that of Gebel Uweinat.

Part II (Cambrian to L. Cretaceous) 10 Marks

Question 2 (A-B) : (10 Marks)

Answer the following question:

2-A: In a geological time table write the Paleozoic rock units in northern and southern parts of Western Desert. (7 Marks)

2-B): Discuss the Jurassic rocks in Egypt. (3 Marks)

Part III (Upper Cretaceous to Quaternary) 20 Marks

Answer TWO Questions of the following:

Question 3: (10 Marks)

Describe in a time table the litho-, bio- and chemostratigraphy as well as the paleoenvironment and paleontology of the Paleocene-Eocene boundary interval as given in the Global Stratotype Section and Point (GSSP) at Dababiya village , south Luxor, and correlate stratigraphically the rock units of this interval in both Dababiya and Abu Ghurra. (10 Marks)

Question 4: (10 Marks)

Compare and correlate in a time table the Oligocene-Miocene rock units in the Northern Western Desert, the Nile Delta and the Gulf of Suez. (10 Marks)

Question 5 (A- B): (10 Marks)

5-A: Select from list B the equivalent rock units to those of list A, and re-arrange the units of list A in stratigraphic order according to their ages. (5 Marks)

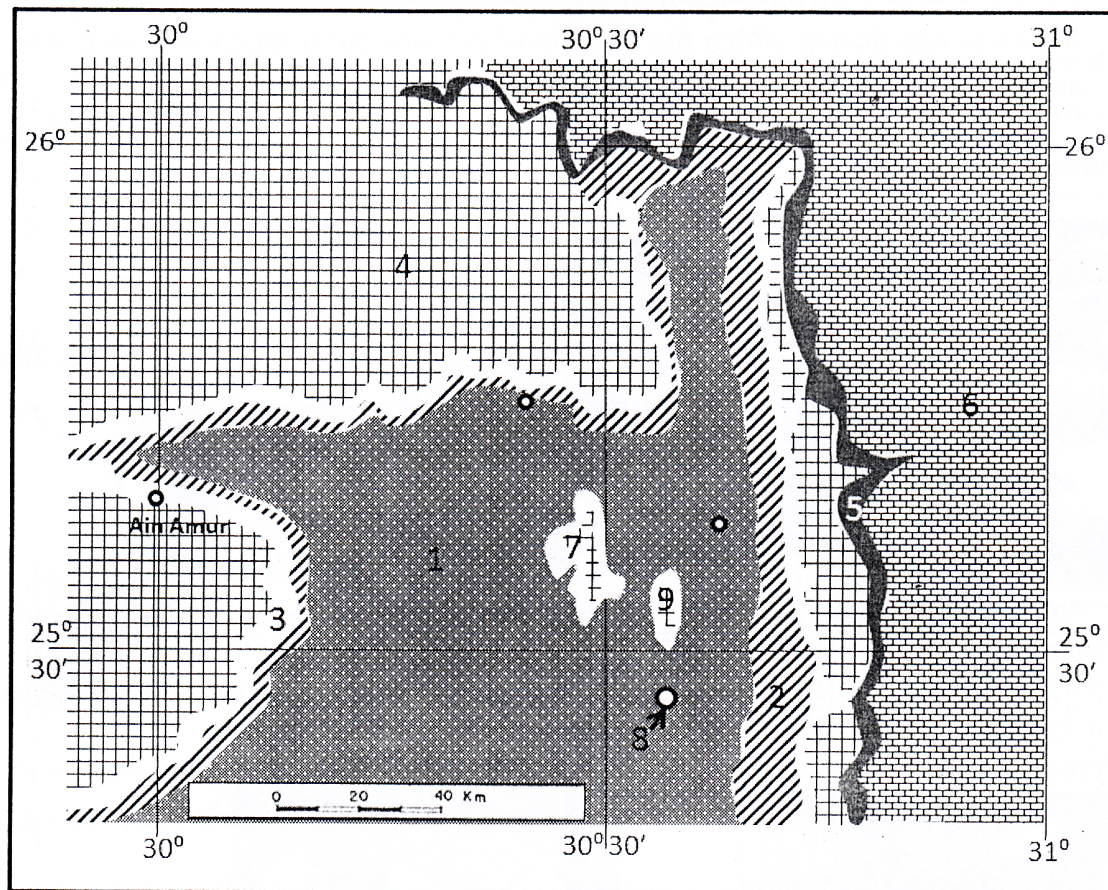
List A

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List B

Rudeis Formation
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Syatin Formation
Tarawan Formation-Hanadi Member
Observatory Formation
El Qurn-Wadi Garawi Formation
Abu Madi Formation
Geisum Formation
Qasr El Sagha – Qattrani Formation
Dungul Formation

5-B: Look to the following map and define: a) the name of district, b) the names , lithology and age of rock units from 1 to 6, C) the name of topographic and geographic features from 7-9 (5 Marks)



**Part IV (Structural Framework, Paleogeography and Paleoenvironment)
(10 Marks)**

Answer the following question:

Question 6 (A-C)

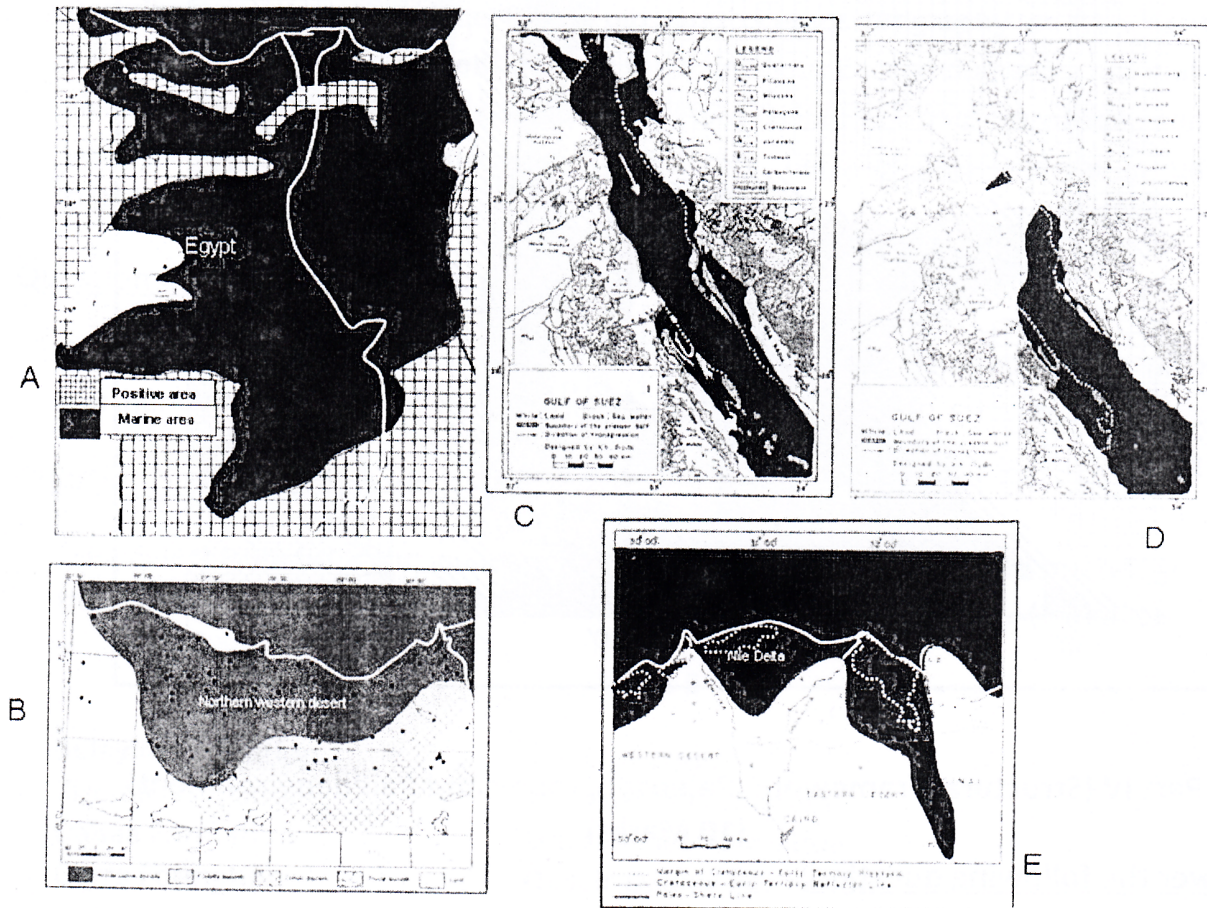
6-A: Answer only ONE of the following. (3.5 Marks)

- a) Write short notes about the Keraf fault zone
- b) Display the main features of the Hammamat Sediments

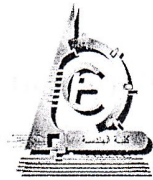
6-B: Compare and correlate only ONE of the following. (2.5 Marks)

- a) The Carboniferous sediments at Sinai and Wadi Araba.
- b) The Cenomanian sediments at Northern Sinai and Bahariya Oasis.

6-C: Look to the following paleogeographic maps and define the Period, Epoch and Absolute age during which the Egyptian land was submerged in a way such as in figures A, B, C, D and E. (4.0 Marks)



Good Luck. Prof. Khaled Ouda; Prof. Ali Khudeir; Prof. Nageh Obaidalla



Important
remarks

- No. of pages: 2 - No. of questions: 4

Answer the Following Questions (Total 50 degrees):

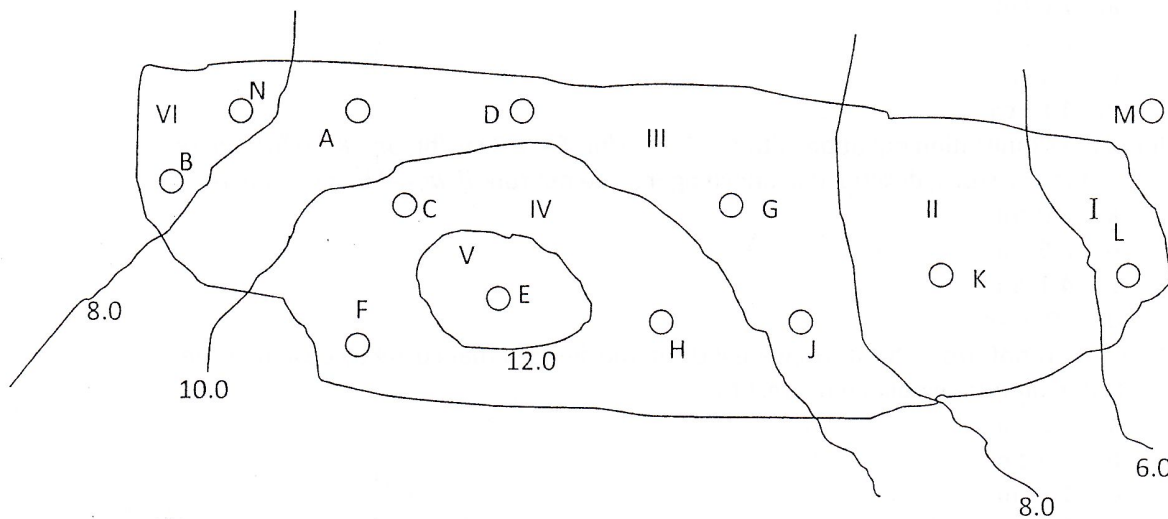
Q1. (15 marks) A small catchment of area 150 ha received a rainfall of 7.0 cm/hr in 90 min duration due to a storm. At the outlet of the catchment, the stream draining the catchment has an initially discharge equal to $1.0 \text{ m}^3/\text{sec}$ before the storm. After the beginning of the storm, the stream discharge is increased to $3.0 \text{ m}^3/\text{sec}$ for 10 hr period. The stream has again the same initially discharge after this period. What is the amount of water losses in centimeters? Also, compute the runoff coefficient.

Q2. (15 marks) Point rainfall due to a storm at several rain gauge stations in a basin are shown in Fig. below. Determine the average depth of rainfall over the basin by two methods.

Station	A	B	C	D	E	F	G	H	J	K	L	M	N
Rainfall (cm)	8.8	7.6	10.8	9.2	13.8	10.4	8.5	10.5	9.5	7.8	5.2	5.6	7.4

The areas between the isohyets are as follows in Km^2 :

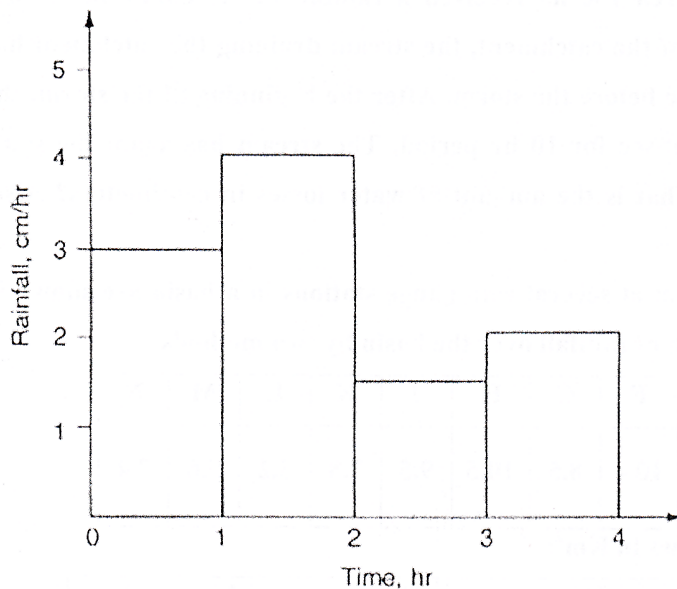
I	II	III	IV	V	VI
410	900	2850	1750	720	550



Please turn the page
→

Q3. (10 marks) The average air temperature for a certain month above a lake surface is 30°C , actual vapor pressure, e_a , is 23.0 mb and the relative humidity is 60%. The average wind speed as measured at a nearby weather station at 20 meters elevation is 10m/s. estimate the average daily evaporation for the same month (assume $a = 0$ and $b = 0,015$). Where $f(u) = a + b U_{20}$.

Q4. (10 marks) A rainfall hyetograph is presented in the shown Figure.



a. The total storm precipitation is most nearly

- 2.0 cm
 - 2.6 cm
 - 4.1 cm
 - 10.5 cm
- b. If Horton's infiltration equation with $f_o = 2.0$ cm/hr, $f_c = 0.8$ cm/hr, and $k = 0.5$ /hr were applied to the storm described in above figure, the net runoff would be most nearly
- 2.0 cm
 - 2.6 cm
 - 4.1 cm
 - 10.5 cm
- c. If the net runoff from the storm were 4.0 cm, the ϕ -index that correctly describes the infiltrated amount would be nearest to
- 1.0 cm
 - 1.5 cm
 - 1.7 cm
 - 2.3 cm

Assiut University



Faculty of Science

Geology Department

ECONOMIC GEOLOGY (G 434)

Final B Sc. Examination

January 2018

Total Marks 50

Time allowed :2hours

*Answer **THREE QUESTIONS ONLY** from the following*

QUESTION NO. ONE IS COMPULSARY

Elucidate your answer with drawings whenever it possible

Question No.1

(Total 20 Marks)

A-What are the genetic; textural and mineralogical differences/or similarities between the known Egyptian iron ores: i-oolitic ironstone formation (S. Eastern Desert; Aswan); ii-Banded iron ore formation (BIF) (Red Sea coast) and iii-Baharia iron ore (Western Desert, Egypt) (Marks 7½)

B-What features distinguishing the ores of the early magmatic stages from those of the late magmatic stages? What are their main ores product? From Where the world largest economic production for these ores come? Where these ores occur in Egypt? (Marks 7½)

C- What are the different sources of water circulated under the Earth Crust and What type of ores that could result from such different sources of water? What factors control the localization of ore deposits? (5Marks)

Answer Only TWO Questions from the following

Question No.2

(Total 15 Marks)

A- How can you genetically classify the different gold occurrences of Egypt to be in harmony with the evolutionary model trend of the Egyptian terrain? Discuss briefly the dominant characteristics genetic aspect for both the Epithermal gold silver (copper) mineralization and the Mesothermal – Orogenic (Lode-gold) mineralization styles . How gold precipitation mechanism goes in the above two different environmental styles? Mention three important Egyptian gold bearing localities and give their average gold content.(grade. g/t) (10Marks)

B-What factors controlling and limiting the development of oxidation zone? What types of ores you look for in the oxidation zone? Elucidate your answer with chemical equations. (5 Marks)

(Continued Overleaf)

Question No.3**(Total 15 Marks)**

A-What are the essential features for the formation of hydrothermal mineral deposits? What are the important criteria for distinguishing fissure filling type hydrothermal deposits? And What are their common forms? How can you interpret the zoning phenomena in pegmatite? What are the characteristics and the economic potentiality of the G1, G2 and G3 Egyptian granite? What are their important associated ores and Where it do occur?

(9Marks)

B-What criteria you should look for and used as evidences of metasomatic origin of certain ore deposit? What are the prerequisites for this important process? What are the common characteristic features of porphyry copper mineralization? What is your explanation for the rarity or absence of copper porphyry deposits in Egypt? Where are the most suggestive sites of exploration for this ore in Egypt?

(6Marks)

Question No.4**(Total 15 Marks)**

A-The tectonic settings of Egyptian terrain posses a close relation to different ore forming processes. What are the main metallogenic deposits in Egypt, which are spatially related to crustal growth of the Egyptian Shield?

(5Marks)

B -Evaporites are formed from different types of water what are these types and What are the requirements of formation of salt deposits? Give the paragenetic sequences of the deposited evaporate assemblage. From Where the natural Egyptian resource wealth comes?

(5Marks)

C-What are the important economic ores or/ minerals that resulted from metamorphic process? Where these deposits occur in Egypt?

(5Marks)**Examiner Prof. Dr. Nadia Sharara****وبالتوفيق**

**Fourth Level Examination in
Seismic Sequence stratigraphy (Gp.426)
For Petroleum Geology students**

Time: Two hours

(50 degree)

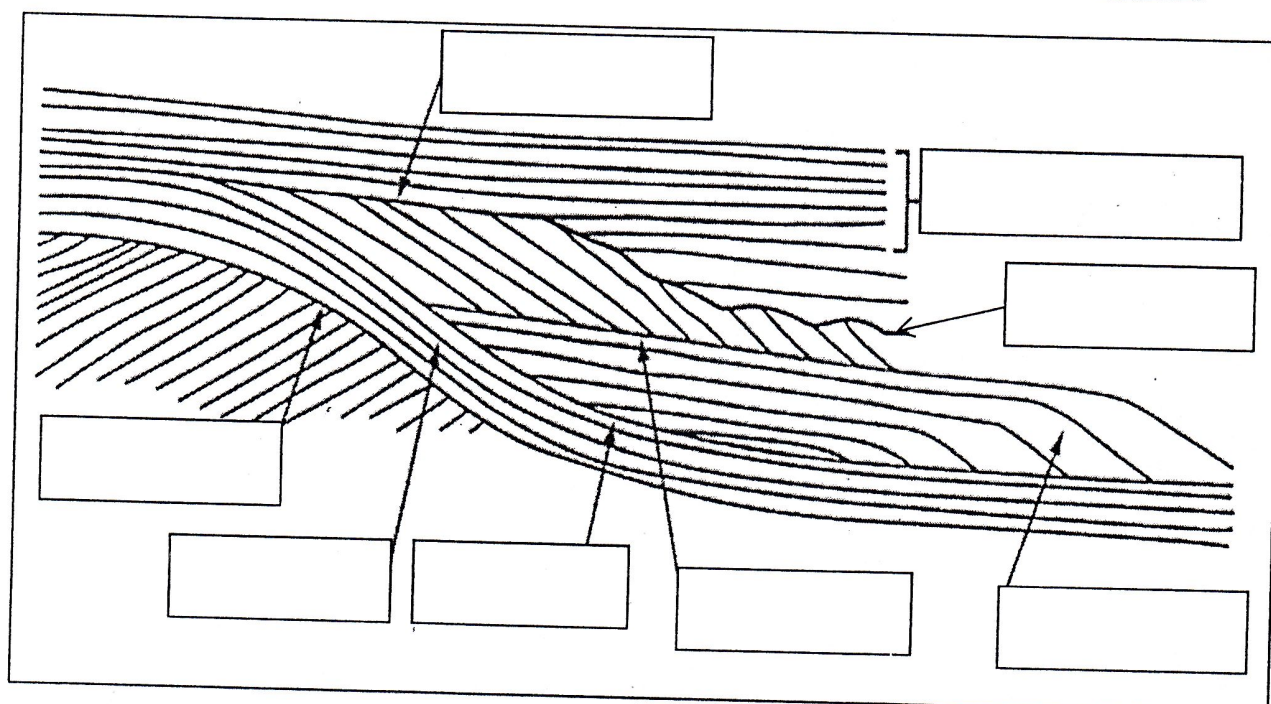
Dec. 2017

I- Answer the following question (*Illustrate your answer by diagrams*):

1. Define lithostratigraphy and sequence stratigraphy. Why is sequence stratigraphy preferred for reconstructing earth history? What are the primary surfaces used by sequence stratigraphers, how do they form, and how are they recognized? **(10 marks)**

II- Write on Four ONLY of the following: **(32 marks)**

2. What are the controls on whether a shoreline will experience transgression or regression? Describe what they are and how they interact. **(8marks)**
 3. What controls the changes in accommodation space? **(8marks)**
 4. What is a parasequence and how are the bounding surfaces recognized? **(8marks)**
 5. How does the vertical stacking pattern of parasequences allow for the recognition of systems tracts? **(8marks)**
 6. The criteria of recognition of sequence boundaries. **(8marks)**
- III- 7-Identify the different types of seismic reflections and terminations given in the following figure (Write in the eight empty boxes) **(4marks)****



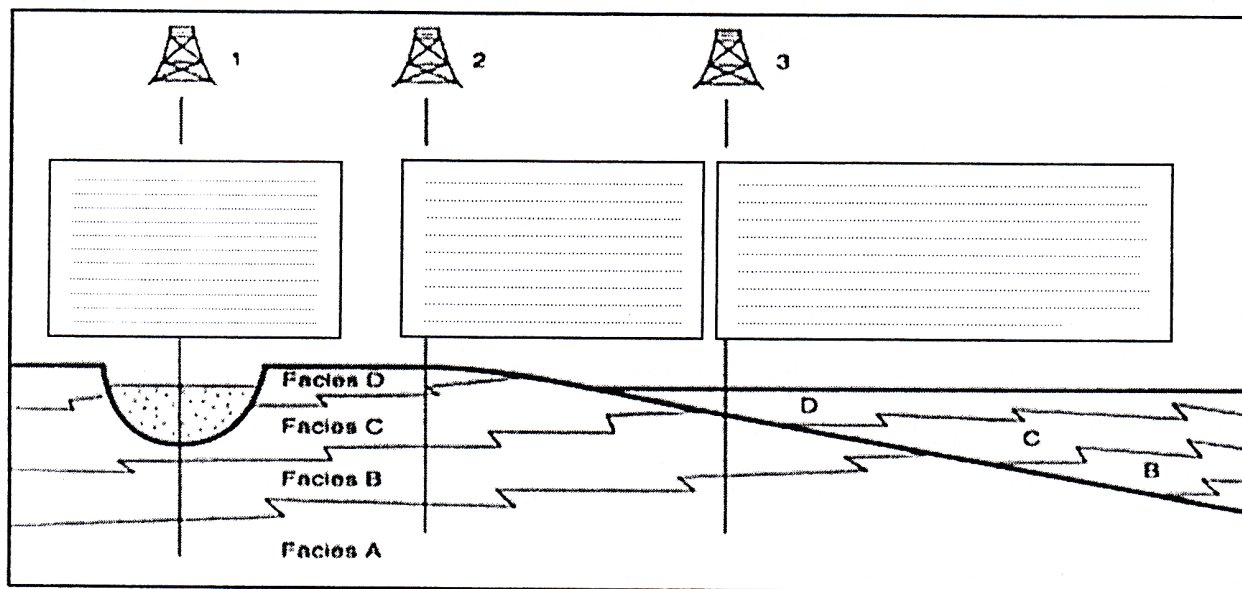
8- a- Write in the three empty boxes below the main feature(s) which each well shows.

b- Which wells show clear evidence of the presence of a sequence boundary, and which wells may find little or no evidence for the boundary? **(4marks)**

Well no. 1

Well no. 2

Well no. 3



GOOD LUCK

Prof. Dr. Ahmed-Reda M. El Younsy

22/12/2017

**Fourth Level Examination in
Seismic Sequence stratigraphy (Gp.426)
For Petroleum Geology students**

Time: Two hours

(50 degree)

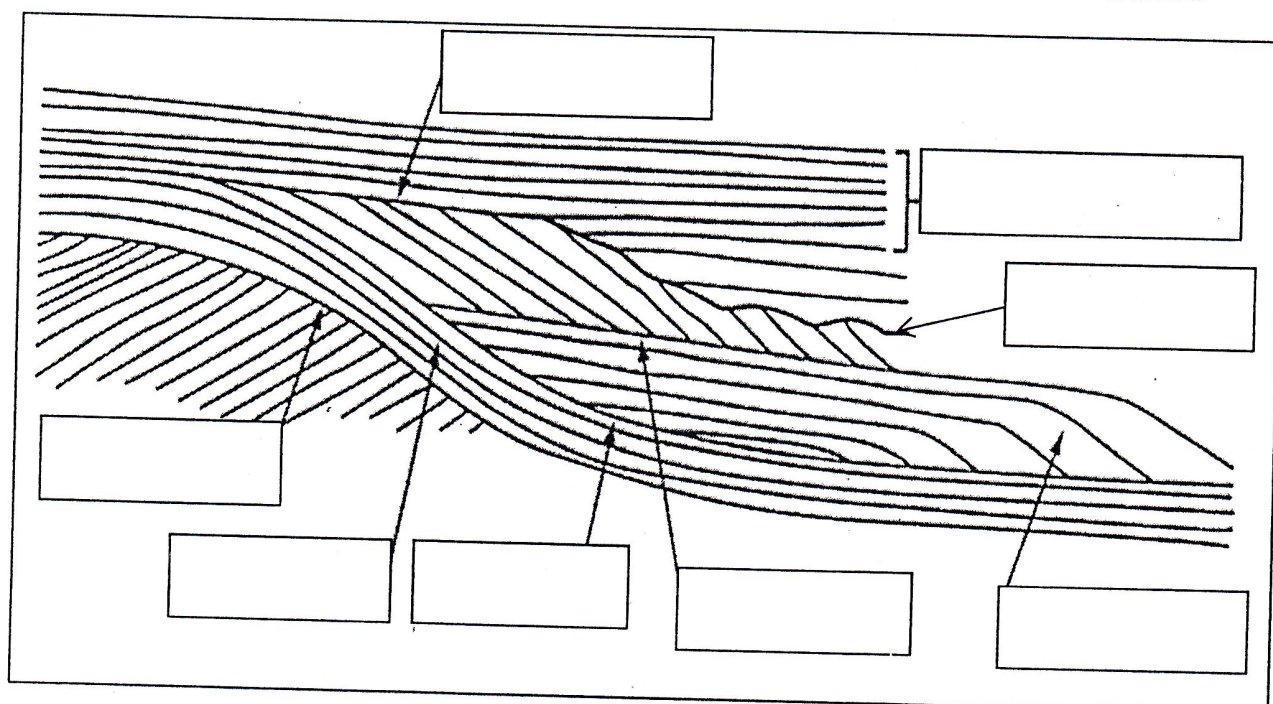
Dec. 2017

I- Answer the following question (*Illustrate your answer by diagrams*):

1. Define lithostratigraphy and sequence stratigraphy. Why is sequence stratigraphy preferred for reconstructing earth history? What are the primary surfaces used by sequence stratigraphers, how do they form, and how are they recognized? **(10 marks)**

II- Write on Four ONLY of the following: **(32 marks)**

2. What are the controls on whether a shoreline will experience transgression or regression? Describe what they are and how they interact. **(8marks)**
 3. What controls the changes in accommodation space? **(8marks)**
 4. What is a parasequence and how are the bounding surfaces recognized? **(8marks)**
 5. How does the vertical stacking pattern of parasequences allow for the recognition of systems tracts? **(8marks)**
 6. The criteria of recognition of sequence boundaries. **(8marks)**
- III- 7-Identify the different types of seismic reflections and terminations given in the following figure (Write in the eight empty boxes) **(4marks)****



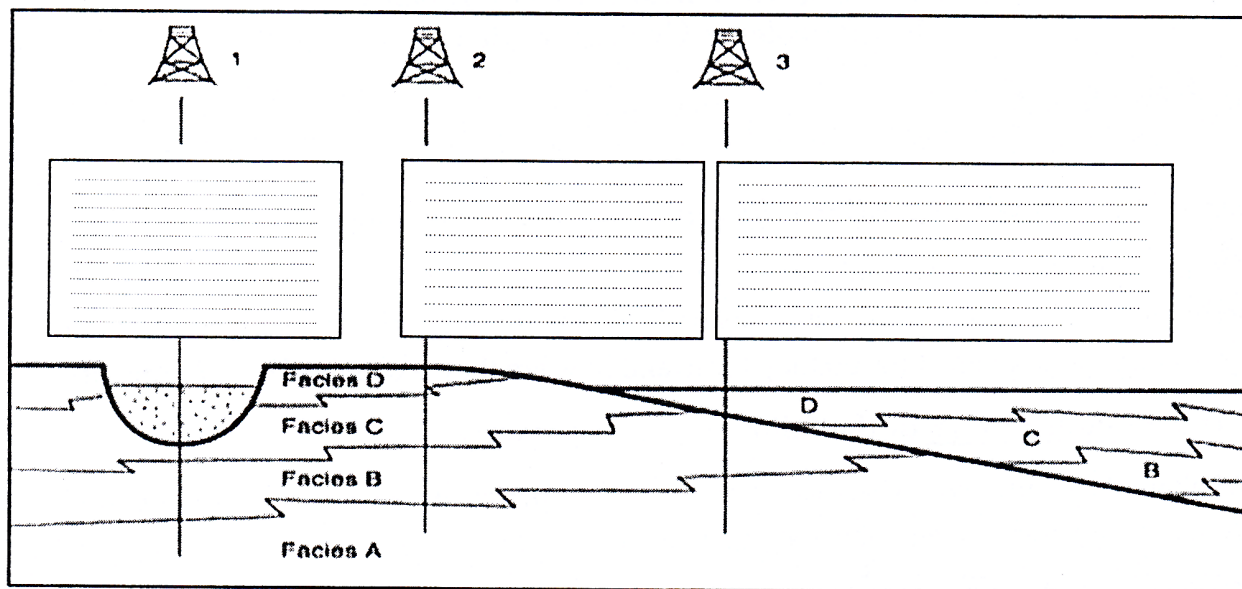
8- a- Write in the three empty boxes below the main feature(s) which each well shows.

b- Which wells show clear evidence of the presence of a sequence boundary, and which wells may find little or no evidence for the boundary? **(4marks)**

Well no. 1

Well no. 2

Well no. 3



GOOD LUCK

Prof. Dr. Ahmed-Reda M. El Younsy

22/12/2017

**Fourth Level Examination in
Sedimentary Basins & Sequence stratigraphy (G420)
For Geology and Geophysics students**

Time: Two Hours (50 degree) 5-Janu. 2018

PART-I: Sedimentary Basins (25 degree)

Answer the following question:

- 1- What is a sedimentary basin? Mention with drawing the three shapes of sedimentary basins. (10 marks)

Answer three questions only from the following:

- 2- What are trenches basins? Write a brief account on the sediments deposited in the Subduction related basins. (5 marks)

- 3- What is a bull-apart basin?
Write a brief account on the sedimentary –fill of the bull-apart basins. (5 marks)

- 4- Define the term rift. Mention only the basins caused by plate divergence. (5 marks)

- 5- a. Choose the correct answer

Backarc basins are formed in:

- Subduction-related basins
- Divergent-related basins
- Collision-related basins

- b. Mention briefly the sedimentary rocks filling the backarc basins. (5 marks)

PART-II: Sequence Stratigraphy (25 degree)

Answer the following TWO questions (Illustrate your answer by diagrams):

I- Write on THREE questions of the following: (15 marks)

- 1- What is relative sea level, how does it differ from mean sea level, what factors influence its change, and how do these factors influence accommodation space?
- 2- Define the difference between Type 1 and Type 2 sequence boundary.
- 3- What does the parasequence stacking pattern depend on?
- 4- What is meant by the correlative conformity and systems tract?

II-Write on, and/or differentiate between Two Only of the following: (10 marks)

- 1- What is the parasequence bounding surface and what its characteristic features?
- 2- Different causes of the transgression.
- 3- What are differences between the progradation, aggradation and retrogradation stacking patterns?

-----GOOD LUCK-----

Prof. Dr. Mohamed Ahmed Soliman

Prof. Dr. Ahmed-Reda El Younsy



Final exam

Subject: Subsurface Geology (G.....), 4th level, Total 50 marks

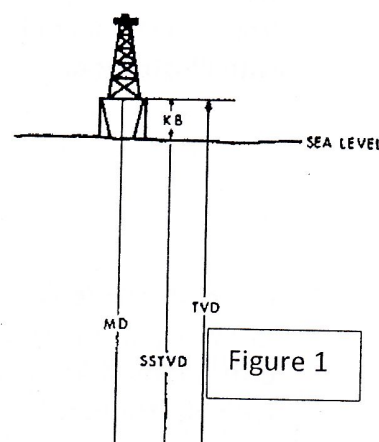
Transfer the questions to your notebook and answer the following:-

I- Complete the missing on only five of the following:-

(15 Marks, 3 marks each)

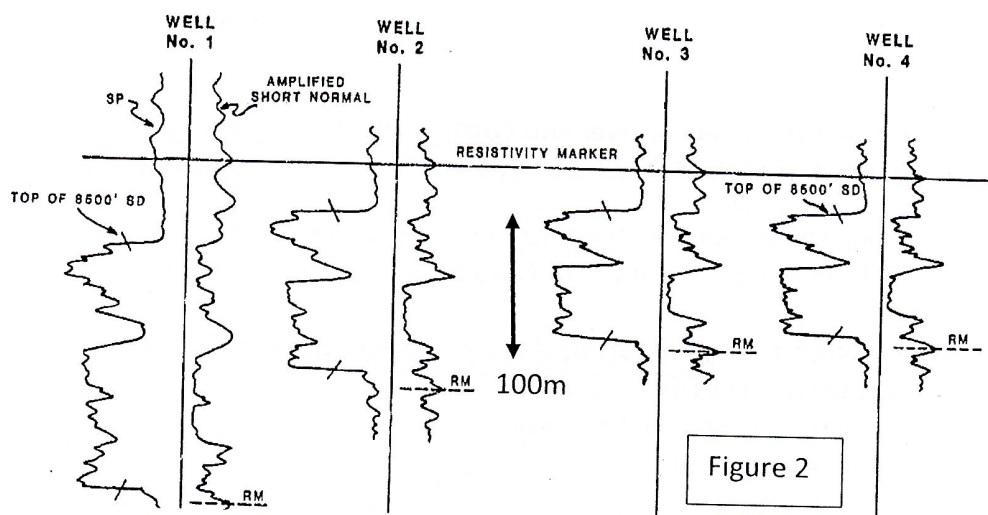
1- A- From the opposite figure 1;

KB is
SSTV is
MD is
TVD is



B- From the opposite figure 2, if the drilling of wells 1, 2, 3 and 4 was vertical and the SD (sandstone) bed was horizontal in the location of well 4, can you calculate the dip angle of this bed in well 1, 2 and 3.

The vertical scale is given on the figure



2- Contouring of subsurface bedding or structure planes is generally carried out by four kinds of contouring. Mentioned these kinds with discussion and illustration:-

- a-
- b-
- c-
- d-

3- Subsurface cross sections are classified based on four roles. **Mentioned these roles and its subdivision sections:-**

- a- b-
c- d-

4- When structure contouring of horizontal bed faulted by normal fault with throw equal to, less than or more than the bed thickness, three contour distribution characterizing each case can be obtained. **Discuss the three cases with illustration:-**

- Case 1
Case 2
Case 3

5- When correlating layers recorded during vertical drilling with those observed from directional drilling the main guidelines that will take into account are:- **with illustration.**

- a-
b-
c-
d-

6- When structure contouring of horizontal bed faulted by reverse fault with throw equal to, less than or more than the bed thickness, three contour distribution characterizing each case can be obtained. **Discuss the three cases with illustration:-**

- Case 1
Case 2
Case 3

II- **Choose the correct answer and comment on your choice with illustration on only ten of the following :- (20 Marks, 2 mark each)**

1- In log correlation for structure the correlation must start:-

- a- From top to bottom b- From bottom to top c- From bedding surfaces

2- Drilling horizontal layers by directional drilling TMT is increasing with:-

- a- Decreasing of deviation angle
b- Increasing of deviation angle
c- Increasing of dip angle

3- Increasing of layers thickness in the upthrow side of the fault plane in compared with in the downthrown side indicating to:-

- a- Normal growth fault b- Reverse growth fault c- Wrench growth fault

4- Repetition of layers during vertical drilling with decreasing toward a definite direction in the repetition interval indicates to:-

- a- Reverse fault b- normal fault c- recumbent fold

- 5- Nosing in the structure contour map with centre- ward decreasing of contour values and similar contour distance in both sides denoting to:
 - a- Asymmetric plunging syncline
 - b- Symmetrical plunging anticline
 - c- Symmetrical double plunging syncline
- 6- Intersection and irregularity in contours of ratio, percentage, isolith and isopach maps of time rock unit indicate to:-
 - a- Regular sedimentation
 - b- Erosion
 - c- Migration of strand line
- 7- Double nosing in the structure contour map with centre- ward decreasing of contour values and similar contour distance in both sides denoting to:
 - a- Asymmetric plunging syncline
 - b- Symmetrical double plunging anticline
 - c- Symmetrical double plunging syncline
- 8- Concordance of maximum isopach contours of successive subsurface layers denoting to:-
 - a- Post sedimentary uplift
 - b- Syn-sedimentary subsidence
 - c- Post sedimentary subsidence
- 9- Vertical variability maps are generally explaining the variation in the sedimentary sequences of:
 - a- Shelf area
 - b- Intera-cratonic area
 - c- Cratonic area
- 10- Wrench Faults of horizontal displacement and vertical fault plane can be recognized on structure contour map by:
 - a- Nosing of contour lines
 - a- Pending of contour lines
 - d- Repetition of contour lines
- 11- Geosynclinal area in isopach map is characterized by:
 - a- Abrupt increasing in the contour distance toward zero contour
 - b- Irregular and random distribution of contour lines
 - c- Regular and oval shape of contour lines

III- What is the differences with illustration between six only of the following:- (15 marks, 2.5 marks each)

- 1- Subsurface geologic model and fence diagram
- 2- TVT, TVDT, MLT and TST during log correlation
- 3- Unconformities and faults during correlating well logs of vertical drilling in dipping layers.
- 4- Onlap and offlap phenomena on isopach maps of successive sedimentary sequences.
- 5- Structure contouring of bedding planes, fault planes and axial plane of folds
- 6- Data derived from well sampling and that from well measurements
- 7- Isopach, isochore, isolith, lithoface maps

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

**Fourth Level Examination in
Sedimentary Basins & Sequence stratigraphy (G420)
For Geology and Geophysics students**

Time: Two Hours (50 degree) 5-Janu. 2018

PART-I: Sedimentary Basins (25 degree)

Answer the following question:

- 1- What is a sedimentary basin? Mention with drawing the three shapes of sedimentary basins. (10 marks)

Answer three questions only from the following:

- 2- What are trenches basins? Write a brief account on the sediments deposited in the Subduction related basins. (5 marks)

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Write a brief account on the sedimentary –fill of the bull-apart basins. (5 marks)

- 4- Define the term rift. Mention only the basins caused by plate divergence. (5 marks)

- 5- a. Choose the correct answer

Backarc basins are formed in:

- Subduction-related basins
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- b. Mention briefly the sedimentary rocks filling the backarc basins. (5 marks)

PART-II: Sequence Stratigraphy (25 degree)

Answer the following TWO questions (*Illustrate your answer by diagrams*):

I- Write on THREE questions of the following: (15 marks)

- 1- What is relative sea level, how does it differ from mean sea level, what factors influence its change, and how do these factors influence accommodation space?
- 2- Define the difference between Type 1 and Type 2 sequence boundary.
- 3- What does the parasequence stacking pattern depend on?
- 4- What is meant by the correlative conformity and systems tract?

II-Write on, and/or differentiate between Two Only of the following: (10 marks)

- 1- What is the parasequence bounding surface and what its characteristic features?
- 2- Different causes of the transgression.
- 3- What are differences between the progradation, aggradation and retrogradation stacking patterns?

-----GOOD LUCK-----

Prof. Dr. Mohamed Ahmed Soliman

Prof. Dr. Ahmed-Reda El Younsy

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

**Fourth Level Examination in
Sedimentary Basins & Sequence stratigraphy (G420)
For Geology and Geophysics students**

Time: Two Hours (50 degree) 5-Janu. 2018

PART-I: Sedimentary Basins (25 degree)

Answer the following question:

- 1- What is a sedimentary basin? Mention with drawing the three shapes of sedimentary basins. (10 marks)

Answer three questions only from the following:

- 2- What are trenches basins? Write a brief account on the sediments deposited in the Subduction related basins. (5 marks)

- 3- What is a bull-apart basin?
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- 5- a. Choose the correct answer

Backarc basins are formed in:

- Subduction-related basins
- Divergent-related basins
- Collision-related basins

- b. Mention briefly the sedimentary rocks filling the backarc basins. (5 marks)

PART-II: Sequence Stratigraphy (25 degree)

Answer the following TWO questions (*Illustrate your answer by diagrams*):

I- Write on THREE questions of the following: (15 marks)

- 1- What is relative sea level, how does it differ from mean sea level, what factors influence its change, and how do these factors influence accommodation space?
- 2- Define the difference between Type 1 and Type 2 sequence boundary.
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II-Write on, and/or differentiate between Two Only of the following: (10 marks)

- 1- What is the parasequence bounding surface and what its characteristic features?
- 2- Different causes of the transgression.
- 3- What are differences between the progradation, aggradation and retrogradation stacking patterns?

-----GOOD LUCK-----

Prof. Dr. Mohamed Ahmed Soliman

Prof. Dr. Ahmed-Reda El Younsy

Geology Department Faculty of Science Assiut University		Time: 2 H First Semester 2017/2018
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First Semester Final Examination –

Subject: Sandstone and carbonate reservoirs (PG 462)

Students: 4th Level of Petroleum Geology (50 Marks)

Part I: Sandstone Reservoirs (25 Marks)

Answer the FIRST Question and Only ONE of the others:

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

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

- 1- Porosity measures the ability of fluids to flow through rock ().
- 2- Fracture porosity is a form of secondary porosity generated by tectonic fracturing of the rock ().
- 3- For authigenic feldspar, alkaline pore waters rich in Na^+ or K^+ , Al^{3+} and Si^{4+} are necessary ().
- 4- The early precipitation of calcite permits later quartz overgrowth formation and feldspar alteration to clays ().
- 5- Burrowing and boring by organisms can increase the compaction of the sediment and usually destroys any laminations or bedding ().
- 6- Absolute porosity is the percentage of interconnected void space with respect to the bulk volume ().
- 7- The precipitation of clay rims usually is the latest diagenetic event, often post-dating quartz overgrowths or calcite cementation ().
- 8- The precipitation of clay minerals and zeolites in sandstone increases its permeability and porosity ().
- 9- Where clay rims are thick, they may inhibit later cementation and so preserve porosity ().
- 10- Pyrite is commonly altered to goethite/limonite on surface weathering ().

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

Write on the following:

- i) Porosity in view of identification, types and factors affecting on it. (8 marks)
- ii) Silica and carbonate cementation in sandstones. (7 marks)

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

Write on the following:

- i) Compare briefly between the following: (8 marks)
 - a) Quartz arenites and quartz wackes.
 - b) Reservoir rock and Source rock.
 - c) Absolute porosity and effective porosity.
 - d) Intergranular porosity and Intragranular porosity.
- ii) Feldspar authigenesis in sandstones. (3 marks)
- iii) Staining techniques for sandstone thin sections. (4 marks)

أنظر خلفه (باقي الأسئلة في الخلف)

Part Two: Carbonate Reservoirs (25 marks)

Answer only Three questions out of the following

Question (1): True or False (8.5 marks).

1. The major difference between carbonates and siliciclastics is that carbonates carbonate minerals are susceptible to rapid dissolution, cementation, recrystallization, and replacement at ambient conditions in a variety of diagenetic environments (1.5 marks).
2. The precipitation of carbonate is very rare in warm, shallow seawater; most carbonate sedimentation takes place on oceanic basins in the tropics in cold water environment (1.5 marks).
3. The influx of clastic sediments can shut off carbonate sediment production and kill the carbonate factory (1.5 marks).
4. Ooids typically form in agitated waters where they are frequently moved as sand waves, dunes and ripples by tidal and storm currents, and wave action (2 marks).
5. Tidal flats are vast areas, regularly to rarely covered by water, dominated by weak currents and wave action. Tidal flat carbonates are dominantly micrites, often pelleted, although local lenses of coarser sediment (grainstone) may represent tidal channel fills (2 marks).

Question (2) Write in detail on the following items (8.5 marks).

1. Carbonate rimmed shelves (4.5 marks).
2. Zones of carbonate accumulation (the carbonate factory) (4 marks).

Question (3) Fill in the spaces with appropriate terms (8.5 marks).

1. Many reef limestones would be classified as(Folk classification, 1959) or(Dunham classification, 1962) (1.5 marks).
2. The depth at which the rate of solution of CaCO_3 is balanced by the rate of supply is known as the This depth varies in the oceans between and for calcite and for aragonite is about (1.5 marks).
3. Various types of carbonate platform are recognized and the broad categories are:;; and (2 marks).
4. are spherical, cylindrical or angular grains, composed of micro-crystalline carbonate, but with no internal structure. Most of them are of fecal origin and so can be referred to as They are most common in the sediments of protected environments such as and (1.5 marks).
5. Isolated platforms are water platforms, usually with sides, which are surrounded by water. They will have marginal and sand bodies, with quieter-water, sandy muds and muds in the platform interior and possibly sandy islands with tidal flats around (2 marks).

Question (4) Write in detail on the following items (8.5 marks).

1. Dunham classification of limestone (1962) (4 marks).
2. Reefs and carbonate buildups (4.5 marks).

انتهت الأسئلة

Prof. Dr. Abdalla El Ayyat

Prof. Dr. Mahmoud Essa



Part II -HYDROGEOLOGY 60 minutes, Total 25 marks

Answer the following question:

1. Discuss briefly: (12 Mark)
- a. The different types of groundwater aquifers. (4 Mark)
 - b. The major and minor dissolved constituents in the groundwater (4 Mark)
 - c. The differences between the saturated and unsaturated zones. (4 Marks)

Answer only ONE of the following questions:

1. Give an account on: (13 Mark)
- a. Agricultural uses of groundwater. (5 Mark)
 - b. Hydrological cycle. (4 Mark)
 - c. Water bearing formations. (4 Mark)
2. Write short notes on the following: (13 Mark)
- a. Depth and groundwater quality variations. (4 Mark)
 - b. Vertical distribution of the groundwater. (4 Mark)
 - c. Groundwater aquifers in Egypt. (5 Mark)

Prof. El sayed Abu El Ella

- 3- For petroleum generation and accumulation, five fundamental or essential elements must be present. Mentioned these elements with **discussion**:-
- a-
 - b-
 - c-
 - d-
 - e-
- 4- Petroleum can be divided into five categories of organic compounds. For each, give the name and sketch the representative chemical structure. Put stars or highlight the two that are abundant in most of crude oils.
- a-
 - b-
 - c-
 - d-
 - e-
- 5- In western desert oil fields the main source rocks are and formations which are belonging to Jurassic – Cretaceous ages. Whereas, the clastic reservoir rocks are formation that belonging to Paleozoic and formation which belonging to Lower and Upper Cretaceous.

II- Choose the correct answer and **comment on your choice on six only** of the following :- (9 Marks, 1.5 mark each)

- 1- At Metagenesis zone of petroleum maturation, the produced hydrocarbon is mainly:-
 - a- Gas
 - b- Oil
 - c- Both oil and gas
- 2- Secondary migration of hydrocarbons is generally carried out:-
 - a- From source rock to reservoir rock
 - b- From migration rock to reservoir rock
 - c- From migration rock to source rock
- 3- Capillary pressure in the reservoir is generally proportion inversely with:-
 - a- Pore size of the reservoir rocks
 - b- Viscosity of oil in the reservoir rock
 - c- Mineral composition of reservoir rocks
- 4- At the Western desert and Saini, the Syrian Arc structural system is associated with different sedimentary basins, accordingly, most of oil traps in these region are:-
 - a- Stratigraphic traps
 - b- Structural traps
 - c- Combined traps

- 5- Hydrodynamic traps are generally occurred with occurrence of :-
- a- Rechargeable groundwater aquifer
 - b- Folds or faults
 - c- Lateral stratigraphic variations
- 6- The sequence of hydrocarbon exploration by geophysical methods is generally organized as:-
- a- 2D&3D seismic reflection and borehole geophysics followed by Gravity and/or magnetic methods and borehole geophysics
 - b- Gravity and/or magnetic methods followed by 2D&3D seismic reflection and borehole geophysics
 - c- borehole geophysics followed by Gravity and/or magnetic methods then 2D&3D seismic reflection
- 7- Which of these condition generate oil:-
- a- Alginite kerogen at depth level 2.5-4km and low temperature
 - b- Exinite kerogen at depth level 4-5km and high temperature
 - c- Eneptite kerogen at depth level more than 5km and high temperature

III- What is the differences with illustration between four only of the following:- (6 marks, 1.5 mark each)

- 1- Stratigraphic traps associated with unconformities and that unassociated with unconformities
- 2- Surface geophysics and borehole geophysics in hydrocarbon exploration
- 3- Source rocks, reservoir rocks and sealing rocks
- 4- Gas cap and water driving for oil production
- 5- Lateral and vertical continuity indexes and their effect in reservoir productivity

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



Part II -HYDROGEOLOGY 60 minutes, Total 25 marks

Answer the following question:

1. Discuss briefly: (12 Mark)
- a. The different types of groundwater aquifers. (4 Mark)
 - b. The major and minor dissolved constituents in the groundwater (4 Mark)
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 - c. Water bearing formations. (4 Mark)
2. Write short notes on the following: (13 Mark)
- a. Depth and groundwater quality variations. (4 Mark)
 - b. Vertical distribution of the groundwater. (4 Mark)
 - c. Groundwater aquifers in Egypt. (5 Mark)

Prof. El sayed Abu El Ella

Geology Department

Faculty of Science

Assiut University

Examination for Fourth Year Students of Faculty of Science in

Geological Map of Egypt (Course, 410G)

Write Briefly on the Following Topics:

(1) Write on the Pre-Cambrian Rocks in Egypt Showing:

- (A) The geographic distribution of these rocks.
- (B) Lithology of these rocks.
- (C) Different names of these rocks.
- (D) Age of these rocks.

(2) The Lithological & Stratigraphic Difference between the Quseir Formation, Dakhla Formation & Esna Formation.

(3) The occurrence of Quaternary Sediments in Egypt.

(4) The Geomorphology of the Egyptian Eastern & Western Deserts.

(5) Write on the Nubian Formation From the Points of:

- (A) Nomenclature.
- (B) Geographic Distribution.
- (C) Stratigraphic Setting.
- (D) Lithology.
- (E) Depositional Environment.
- (F) Economic Importance.

(6) The Name of Rock Units in Egypt of the: 1) Upper Cretaceous, 2) Paleocene & 3) Eocene.

(7) The Tectonic Events and development of the:

- 1) Red Sea, Gulf of Suez & Nile Valley.
- 2) Syrian Arc System.

Good Luck

b. (9M)

Particular sampling position on the drift of a gold vein consists of five different sections. The densities of the selection have been approximately constant. The sampling width and assay values of the sections are given in the following table:

Section	Width, (w, inch)	Assay, %
A	12	25
B	10	20
C	8	45
D	15	12
E	11	15

Find:

- 1- The average assay in this position. (3M)
- 2- The mining assay if the stopping width is 16 inches more than the clean width.(3M)
- 3- The width of the vein at the sampling position. (3M)

Q2(10 M)

- a. Remember the importance of mining development? (5M)
- b. Remember the advantage and defects of the inclined shaft? (5M)

إنتهت الأسئلة وبالتوفيق

أ.د/ جمال يحيى - قسم هندسة التعدين والفلات

أ.د/ جلال حامد الحباك - قسم الجيولوجيا

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أ.د/ جمال يحيى - قسم هندسة التعدين والفلات

أ.د/ جلال حامد الحباك - قسم الجيولوجيا

Credit hour system - First semester - Final Examination 27/12/2017

Geology and Geophysics Programs

Engineering Geology and Mining Geology (G 407)

Fourth Level

Allowed time 2 hour

(ملحوظة الامتحان في صفتين)

Part (1) Engineering Geology Exam (25 M)

Answer Three Only of the following questions

Q1(7.5 M)

- Compare between both faults and folds to tunnel excavation?
- Discuss the preliminary studies at the reservoir area and dam site?

Q2 (7.5 M)

- Explain the role of driving and resisting forces on slopes and how these are related to slope stability?
- Mention the various types of soils with emphasizes on aggregate gradations?

Q3 (7.5 M)

- Explain the factors affecting excavation of rocks ?
- Write on the various sources of engineering geological information?

Q4 (7.5 M)

- Mention the engineering characteristics of rocks?
- How slope angle and topography, vegetation, and time affect both slope processes and the incidence of landslides?

Part (2) Mining Geology Exam

Answer the following questions (25 M)

Q1(15 M)

a. Define the following: (6M)

- Channel sampling.
- Chip sampling.
- Sampling drill hole.
- Grab sampling.

أنظر خلف الورقة



First Semester Final Examination

Subject: Course No. G433 (Geochemistry)

Students: B.Sc. Students (Geology and Geology-Chemistry)

Date: Dec., 18, 2017

II- Geochemistry of sediments

Time allowed: one hour

Examiner: Prof. Dr. Mamdouh F. Soliman

الامتحان في أربع صفحات

Write your answers in the same sheets

اكتب أجابتك في نفس ورق الأسئلة

Select or write the correct answer for the following : (25 marks, one mark for each)

1-Which one of the following is NOT typical of "Asteroids"

- A. Inner-belt asteroids tend to be silicate-rich
- B. Outer-belt asteroids tend to be carbon-rich
- C. Asteroids are small bodies made of rock, dust and ice
- D. They are undifferentiated bodies

2-Mention five elements of the siderophiles

3-Which one of the following is NOT typical of "Meteorites"

- A. Most stony meteorites are made up, in part, of small glassy spheres 1-2 mm in diameter
- B. They are composed of dark Mg and Fe- rich silicate minerals
- C. They contain some of volatile elements, such as C, H, and O, chemically combined into silicates
- D. They are composed of metallic iron and Nickel
- E. None of the above

4- Below the pH of 4, alumina is almost:

- A. Soluble
- B. Insoluble
- C. Stable

5- The formation of kaolinite due to the hydrolyses of K-feldspar, in acidic rocks leads to:

- A. increase in the volume percent
- B. the exfoliation of the acidic rocks
- C. formation of residual silica
- D. All of them

6-The action of chemical weathering results in Rapid dissolving of:

- A. Na, K, Ca Mg
- B. Mo, U
- C. Both
- D. Non

7-The products of chemical weathering processes can be put into four groups:

A-Soluble constituents removed from weathering sites,

B- Residual primary minerals unaffected by weathering reactions,

C- New stable minerals formed by these reactions, and

D- Organic compounds resulting from organic decay reactions.

Give an example for each of the above four categories?

8-Minerals crystallized at highest temperatures from most hydrous magmas are less stable against weathering under the condition on the Earth's surface EXEPT:

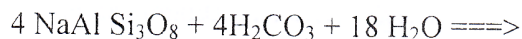
A. The carbonate minerals

B. The silicate minerals

C. The heavy minerals

D. None of them

9-Complete the following reaction:



10-Write by the chemical equation the hydration of the mineral hematite

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11-Which one of the following is NOT typical of " resistates"

A. They are deposited in shallow water on the continental shelves, in lakes and arid deserts.

B. They are usually composed of boulders, grovels, and sands

C. A part of the fine-grained Loose deposits also belongs to them

D. They are poor in quartz

E. They are never contain argillaceous material or limonite

12-Which one of the following is NOT typical of " Hydrolyzates "

A. They consist of

B. residual mineral particles

C. the clay minerals that are formed during weathering

D. biogenic matter formed the sediment after its deposition

E. contain few amount of Al_2O_3

13-The primary factors affecting the manner of migration of manganese are the presence or absence of O_2 and CO_2 -----How can you show that?

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14-Which one of the following is NOT typical of " Bauxites"

- A. They developed on aluminum- rich rocks (syenite and nepheline syenite, granite
- B. They developed on Fe- rich rocks (Basal and gabbros)
- C. The ferric oxides, H_2O , SiO_2 , TiO_2 are usually present

15-Ferrous bicarbonate is readily soluble, but in the presence of molecular oxygen, it is oxidized and iron-carbonate precipitates

A. Correct the wrong in above statement.

16-Mn deposits are present in the zone below the zone of weathering.

- A. True
- B. False (if false, please correct the wrong)

17- (1) Iron sulfides and (2) ferrous minerals (olivine for example) when oxidized, large masses of iron hydroxides and oxides may formed.

Can you show that by chemical reactions?

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18-Calcium carbonate deposited in lakes and around springs is formed as a result of the escape of CO_2 from the water, whereby the solubility of calcium carbonate decreases.

The loss of CO_2 from water may be the result of:

- A.-----
- B.-----
- C.-----

19-What are the types of the Continental evaporates?

- A. ----
- B. ----
- C. ----
- D. ----

20-In Anoxic environments

- A. the sediment interstitial waters contain measurable dissolved oxygen
- B. diagenesis proceeds via the secondary oxidants through anaerobic metabolism.
- C. little organic matter is preserved in the sediments
- D. all above

21 -The euxinic environments include:

- A. The methanic environments
- B. The post-oxic environments
- C. The sulphidic environments

22-Just mention the factors that affect the preservation of organic matter in marine sediments.

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23-Type I kerogen

- A. is derived primarily from planktonic and bacterial remains deposited in marine environments
- B. is consisted primarily of liptinites derived from algal and bacterial remains, often deposited in aquatic or estuarine environments.
- C. is formed principally from the remains of vascular plants

24- During precipitation, the vapor enriched in ^{16}O condensates

- A. Along the coast areas
- B. Inside the continent

25-There is an important and consistent increased in $\delta^{13}\text{C}$ with depth of water

- A. True (why?)
- B. False (why?)

26-Planktonic components have less ^{16}O incorporated in their shells (more +ve $\delta^{18}\text{O}$) than the benthic components (that have more -ve $\delta^{18}\text{O}$)

- A. True
- B. False

انتهت الأسئلة
مع أطيب الأمنيات بالتوفيق
د/ ممدوح فراج سليمان



Well Logging (25 marks)

Answer the following questions:

1. What are: (6 marks)

- The 4 conditions where SP log cannot be recorded?
- The role of focused resistivity tools and micro resistivity tools?
- The advantages and disadvantages of well logging?

2. a) If the bottom hole temperature (BHT) = 65°C @ 2500 m, geothermal gradient = $1.46^{\circ}\text{C}/100\text{m}$, calculate the formation temperature (T_f) @ 1240 m? (3 marks)
- b) Write two formulas for estimating each of: permeability – shale volume. (2 marks)

3. Explain FOUR ONLY of the following: (8 marks)

- GR log as a tool for detecting sedimentary rock facies.
- Detection of hydrocarbon source rocks from two different well logging methods.
- The constituents of the onshore motorized logging truck.
- Sonic log tool elements showing the theory of using it for measuring porosity.
- Procedures for obtaining formation water resistivity (R_w) from SP.

4. Give shortly the reason of THREE ONLY of the following: (6 marks)

- Electrochemical creation of self potential.
- The neutron log will read too low values against gas bearing zones, but too high against shale.
- Lateral resistivity tools are preferred in use than normal resistivity tools.
- Formation of mud cake, breakouts and washouts.

Petrophysics (25 marks)

I. Define the following :

(5 marks)

Salinity – Hardness – Poisson's ratio – Cleavage – Bulk modulus

II. Write on FOUR ONLY of the following:

(20 marks)

- 1- The resistivity of clay and types of Conductivity.
- 2- Absolute permeability and Initial Oil
- 3- Porosity on Carbonate rocks and Kozeny correlation
- 4- Factors affected on Resistivity and Quartzose sediment
- 5- Factors affecting on the magnitude of Permeability and Initial Gas
- 6- Oil – water system and the resistivity of shale

Good Luck !!

نهاية الأسئلة
Prof. Dr. Awad A. Omran & Dr. Mohamed F. Khalil



First Semester, Third Level Final Examination

Time: 2hours	Total marks: 50	Seismic Exploration and Earthquake Seismology (G350)	January, 2018
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First Part: Seismic Exploration (25 marks)

Answer the following questions:

I- Mark the following statements with False (X) or correct (✓) and correct the false statements: (10 marks)

- 1) () The detected depth in the refraction method is directly proportional to length of the measured profile.
- 2) () Shear wave is the fastest kind of the seismic waves.
- 3) () Seismic reflection occurs whenever there is a contrast in acoustic impedance between the rock layers ($\rho_1 v_1 \neq \rho_2 v_2$).
- 4) () Intercept time is the actual time for refracted waves recorded near the shot point.
- 5) () In anisotropic medium velocity of the seismic waves is varied only in the vertical direction.
- 6) () Reflected waves are usually recorded as first peak in the seismograms.
- 7) () The time-distance curve for the reflected waves from dipping interface is a hyperbola whose axis of symmetry is the time axis.
- 8) () Seismic prospecting depends mainly on the change of elastic properties of the medium.
- 9) () Shear seismic waves travel through solids, liquids and gasses.
- 10) () Head waves can be generated and detected near the shot point.

Answer ONLY TWO of the following:

(15 marks, 7.5 marks for each)

Write in details on the following

- a) Find a relation between the raypath parameter and the raypath curvature.
- b) Prove that the refraction time distance curve represents the tangent of the reflection time distance curve at the critical distance.
- c) Types of the secondary waves which generated at the interface between layers in different cases.
- d) Find the equation for the time distance curve for single horizontal reflecting interface and estimate its depth.