



Summer Semester, Final Examination
For 4th Level Students (Geophysics Branch)
On: Petrophysics and Well Logging (459-G)

September 2016	(Total Marks: 50)	Time: 2 hours
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Answer the following questions:

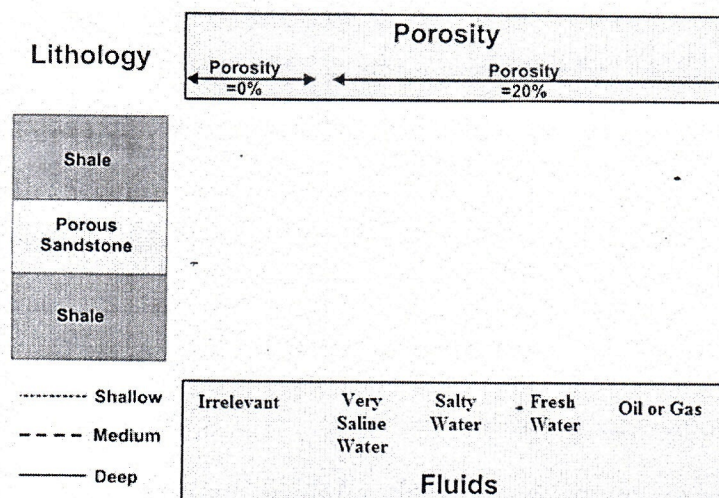
First Question: Write short notes on ONLY EIGHT of the following (Use Sketches when it possible to support your answer): (20 Marks)

- | | |
|---------------------------|--------------------------------------|
| 1. Induction logging tool | 2. Electrochemical potential |
| 3. Log head information | 4. Benefits of borehole casing |
| 5. Array induction logs | 6. Porosity of gas-bearing formation |
| 7. Directional drilling | 8. Bulk density tool |
| 9. Washout and breakout | 10. Types of drilling rigs |
| 11. Scintillation counter | 12. Horner plot and BHT correction |

Second Question: For ONLY FIVE, illustrate by equations the estimation of the following parameters using the accompanied well log: (7.5 Marks)

- | | |
|---|---|
| 1. Shale volume (Gamma-ray log) | 2. Mud-cake thickness (Caliper log) |
| 3. Formation water resistivity (SP log) | 4. Water saturation (Electrical logs) |
| 5. Porosity (Bulk density log) | 6. Temperature gradient (Temperature log) |
| 7. Formation resistivity factor | 8. Total and effective porosities |

Third Question: Draw the shallow, medium and deep resistivity curves for the following five cases shown in the figure below. (7.5 Marks)



Fourth Question: Choose the correct answer.

(5 Marks)

1. _____ log is a record of the total natural gamma radiation from formation rocks through which the drill bit has drilled through.
a. Neutron b. Gamma-ray c. Spectral gamma-ray
2. The ideal SP generated when passing from shale to a clean thick porous sand.
a. Shale-base line b. Static SP c. Pseudostatic SP
3. If the R_{mf} is less than R_w , the SP curve in this case is called _____.
a. Normal b. Reversed c. Flat
4. Gamma ray logs can be recorded in:
a. Cased holes b. Open holes c. Both of them
5. Microresistivity tools are used to measure the resistivity values of the:
a. Uninvaded zone b. Flushed zone c. Both of them

Fifth Question: True (T) or False (F).

(10 Marks)

1. The effect of the presence of shale and gas on the neutron tool is similar, each causing the tool to read low porosities.
2. Drill collar is the heavy square or hexagonal steel member suspended from the swivel through the rotary table.
3. The porosity of the flushed zone is larger than that of the uninvaded zone.
4. Laterologs were originally designed for use in boreholes where the drilling fluid was very resistive.
5. Clean sandstones with K-feldspar, mica, glauconite produces low gamma-ray readings.
6. The recording of temperature is usually made while going down in the borehole.
7. The gamma-ray, density and neutron logs are nuclear measurements.
8. The presence of oil does not affect the neutron tool response as it has approximately the same hydrogen index as fresh water.
9. Cross-plots of K (%) and Th (ppm) concentrations allow the identification of clay minerals.
10. An unexpected entry of formation fluids into the wellbore, causing a rise of mud-level in the mud pit is called a kick.

===== **GOOD LUCK** =====

Dr. Rashad Sawires

Time: 2 Hrs	Economic Geology G434	Summer 2016
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Answer Four questions ONLY of the following illustrating your answer with diagrams

- 1- Define the following terms:
 - a- Gangue mineral.
 - b- Tonnage.
 - c- Stratabound ore.
 - d- Immiscible melts.
 - e- Skarn.
- 2-
 - a. Mention the common types and uses of asbestos?
 - b. Compare between early and late magmatic deposits?
- 3-
 - a. Write on the geology and general characteristics of Platinum-Group Elements (PGE)?
 - b. Discuss the formation of residual mineral deposits with examples?
- 4-
 - a. The plate tectonic setting controls which mineral deposits form, Comment?
 - b. Mention briefly the various sources and types of hydrothermal ore deposits?
- 5-
 - a. Write on the importance of Porphyry Deposits as a copper and gold resource?
 - b. Explain the various types of mode of formation of gold deposits?

انتهت الأسئلة وبالتوفيق

Geology Department Faculty of Science Assiut University	Final Summer Exam Course title: Subsurface Geology Course code: G 409	September, 2016 Total marks: 50 Time: 2 hours
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Answer the following questions:

1- Define the following: (10 marks)

Panel diagram – Key horizon – Geosyncline – Isopach map – Structure section

2- Write on the following: (20 marks)

- a- Recognizing subsidence and uplift from isopach maps.
- b- Identifying stratigraphic traps from isopach maps.
- c- Recognizing the fault from subsurface data.
- d- Methods of contouring.

3- Put the (✓) or (×) sign at each point: (10 marks)

- a- Ratio maps are often used in regional problems and restricted to mapping units containing no more than four variables.
- b- Percentage maps are contoured on the aggregate thickness of a given lithologic facies within a stratigraphic unit.
- c- Topographic maps, structure maps, and isopach maps are quantitative.
- d- Palinspastic maps are drawn to depict the structural patterns for a chosen division of geologic time.
- e- Elongated closed lows frequently suggest a graben area or a down-dropped block.

4- Complete the following sentences: (10 marks)

- a- is used for maps drawn on the inorganic aspects of laterally equivalent strata.
- b- has more widely spaced contours because of a more gradual thickening of sediments in response to gradual subsidence.
- c- account for the major uplifts associated with mountain building and for close folding and complex faulting.
- d- An abrupt increase in the rate of dip perpendicular to strike is the most commonly encountered suggestion of
- e- , , , and provide data that are used in facies mapping.

Good Luck ,,,,,,



**GEOLOGY DEPARTMENT
FACULTY OF SCIENCE
ASSIUT UNIVERSITY**



**Final Exam on Radiometric & Geothermal Methods (G452)
(Two Pages – 50 marks total)**

June 2016

Time: 2 hours

1- Define only five of the following (Excess answers will not consider): (*one and half mark each*)

Isotope	Radioactivity
Curi	Thermal conductivity
Terrestrial heat flow	Half-life time
Ionizing radiation	Thermal gradient

2- Mark the following statements as True or False: (*one and half mark each*)

- a) At low porosity the temperature has minimum effect on variation of thermal conductivity
- b) Correction is needed in geothermal measurements due to tidal effect
- c) Highly conductive salt intrusion displays a thermal high and a gravity low.
- d) Low level of radioactivity is present in almost all rocks and minerals which attributed to traces of U, Th, and isotope of ^{40}K
- e) Orthoclase mineral is most commonly used in U-Th-Pb dating method
- f) Presence of radon at the surface indicates buried uranium concentrations
- g) Salt dome structure will result in high thermal gradient and low thermal conductivity
- h) The advantage of K-Ar age dating method is the abundance of K
- i) The disadvantage of $^{87}\text{R}-^{87}\text{Sr}$ age dating method that it represents a solid-solid system (no loss of daughter)
- j) The greater the depth, the greatest the thermal conductivity and the lowest the thermal gradient
- k) The oxygen isotopes can be used to estimate ancient climate features
- l) The radiometric measurements are usually conducted in conjunction with magnetic and electromagnetic survey

See next page

- m) The Radon Emanometer is not applicable in mapping faults
- n) Thermal conductivity of rocks is controlled by porosity and mineral content
- o) Thermal gradient is more efficient than absolute temperature to detect changes in lithology

3- Write briefly (short notes) on the following: (two marks each)

1. How rocks and minerals are classified based on their radioactivity?
2. What are the importance of studying radioactivity of rocks and minerals?
3. What are the assumptions made in radiometric dating?
4. Explain the procedure for thermal conductivity measurements in soft sediments
5. What are the essential factors in planning any radiometric survey?
6. List the different source of heat energy within the earth
7. List the different heat transfer mechanisms from the earth interior to the surface
8. Write on regions of anomalous heat flow
9. Write on measuring techniques in geothermal prospection method
10. What are the causes of local variations in temperature beneath the ground and regions of anomalous heat flow?

End of questions

Good luck

Course Instructor Dr. Gamal Zidan AbdelAal

(Time: 2 Hours)

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) The Geomorphology of the Eastern & Western Egyptian Deserts.
- (2) The areal distribution & types of Rocks of the Basement Complex in Egypt.
- (3) The Nubian Sandstone in Egypt and its:
 - (a) Nomenclature, (b) Stratigraphic setting, (c) Age, (d) Areal Distribution,
 - (e) Economic importance.
- (4) The Lithological & Stratigraphic Difference between the Quseir Formation, Dakhla Formation & Esna Formation.
- (5) The Name of Rock Units in Egypt of the:
 - 1) Upper Cretaceous, 2) Paleocene, 3) Eocene & 4) Miocene.
- (6) The occurrence of Quaternary Sediments in Egypt.
- (7) The tectonic Events and development of the:
 - 1) Red Sea, Gulf of Suez & Nile Valley,
 - 2) Syrian Arc System.

Good Luck



Final Examination, Geostatistical Methods in Geophysics

Jun. 2016	Geost. Methods (456G)	50 Points	Time: 2 Hours
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I. Answer only three of the following (use illustrations)(21 points)

- A)- Describe the Variogram model and its components, and give four model examples
- B)- Discuss the possibility of random sampling and sample size, give examples
- C)- Compare between the variogram, covariogram and corellogram
- D)- Compare between IDW and Natural neighbors interpolation methods

II. Answer the following question.....(7 points)

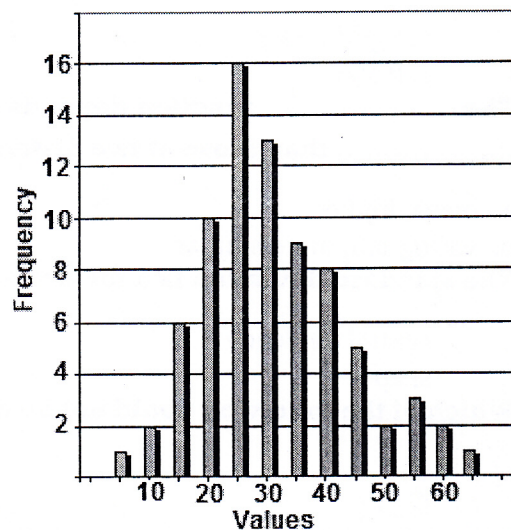
The given Figure represents an equally spaced raster distribution of topographic heights (in meters). Given that the horizontal and vertical distance from cell to another is 250 m. Calculate the value of point "X" using Inverse Distance Weighting" interpolation method for power 1.

215	125	200
200	X	100
350	250	125

III. Answer the following question.....(10 points)

In the following Figure,

- Calculate the Mean, Median, Mode, Range, Root Mean Squared, Variance, Standard Deviation, Kurtosis and Skewness
- Based on the above statistics, give a full description of the frequency curve



IV. Choose the correct answer of the following:.....(12 points)

1. A large mass of data can best be summarized pictorially by means of:

- a. the range
- b. a histogram
- c. the count
- d. a frequency tabe

2. In a frequency distribution of 250 records, the mean is reported as 78 and the median as 65. One would expect this distribution to be:
- normal
 - negatively skewed
 - positively skewed
 - symmetrical
3. In the concept of random sampling, when each object has the same probability of being selected is termed.....
- independence of sampling
 - unbiased sampling technique
 - independence of variable
 - unbiased natural occurrence
4.determine a single function which is mapped across the whole region
- point interpolators
 - local interpolators
 - global interpolators
 - none of the above
5. Given a huge rasterized data distribution, it is wise to useand.....to interpolate this data set
- variogram and kriging method
 - variogram and IDW
 - variogram and nearest neighbor
 - none of the above
6. In a variogram model, the length represents the
- size of data
 - variance of data
 - range of data
 - mean of data
7. is used when a trend, or slow change in average values, in the samples exists.
- Co-Kriging
 - Universal Kriging
 - Ordinary Kriging
 - Block Kriging
8. In geostatistical procedure, the interpolation weights are directly related to.....
- the grid nodes
 - cell size
 - variogram model
 - data volume
9. The function depends on the concept that values at two near locations are than those at two distant locations
- mean, higher
 - variogram, more similar
 - variogram, more different
 - mean, more lower
10. The standard deviation is a measure of of a frequency distribution?
- central tendency
 - shape
 - variability
 - homogeneity
11. Which of the following could not be a correlation coefficient?
- 0
 - 0.23
 - 1
 - 12.3
12. If Test A and Test B have a correlation of -0.85 , it means that
- as the scores on A increase the scores on B increase
 - the scores on B are consistently lower than scores on A
 - Test A and Test B are not related
 - as the scores on A increase the scores on B decrease



Ore genesis (234 G)

Answer the following questions:

1. Mention only the four basic geological requirements for any ore deposit. (5 marks)

2. Complete the followings (10 marks)

- Calcophile and siderophile elements (Ni, Co, Pt, ...) are more likely associated with igneous rocks, whereas, lithophile elements (Sn, Zr, U, W, ...) are typically found in association with igneous rocks.
- Understanding of ore genesis processes requires acknowledge of
- A part of porphyry type deposits may be sulphidation deposits .
- The inner zone in porphyry type deposit is characterized by alteration, whereas the middle part is characterized by and
- There are two main types of magmatic related hydrothermal system (1)....., (2)

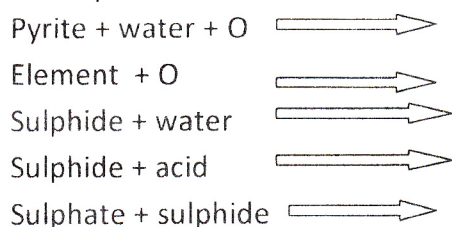
3. Write the metal zonation of VMS deposits. (5 marks)

- A core composed of
- Intermediate zone.....
- The outer or upper zone.....

4. discuss briefly the skarn type deposit model. (5 marks)

5. Complete the following reactions in oxidation and supergene enrichments zones

(10 marks)



LOOK TO BACK

6. Match the ore meta (A) with the ore forming processes (B) (5 marks)

A	B
Chromite	hydrothermal
Cu-Au	sedimentary (residual)
Nb-Ta	magmatic fractionation
Bauxite	metamorphic
Skarn type (W-Mo)	pegmatitic

7. What are the characterization of placer type deposits? (5 marks)

8. The following mineral deposits were formed from one magma series and related hydrothermal system. (5 marks)

Cassiterite-wolframite (SnO-WO), chromite, Au -porphyry type, Cu-Ni-Sulphides, banded iron ore.

Rearrange the mentioned deposits according to their time and processes of formation

With my best wishes

Prof.Dr./Mohamed Abdel Moneim

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

Time: Two Hours (50 degree) June, 2016

PART-I: Sedimentary Basins (25 degree)

Answer the following question:

- 1- a. What is a depocentre? (3 marks)
b. What does the term post-depositional basin mean? (3 marks)
c. Mention the different basin shapes? (3 marks)
Illustrate your answer using drawing.

Answer two questions only from the following:

- 2- a. Choose the correct answer (4 marks)
Backarc basin is formed in:
- Subduction-related basins
- Divergent-related basins
b. What is the economic significance of rift basins? (4 marks)
- 3- a. Choose the correct answer (4 marks)
Pull-apart basins are related to:
- Subduction-related basins
- Strike-slip basins
- Collision-related basins
b. Describe briefly the sedimentary sequence in pull-apart basins (4 marks)
- 4- Write a brief note on the opening phase of the Wilson Cycle. (8 marks)
Illustrate your answer with drawing

PART-II: Sequence Stratigraphy (25 degree)

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

- 1- Write on, and differentiate between **Three only** of the following:
a- What does the parasequence stacking pattern depend on? (6 marks)
b- Normal regression and forced regression. (6 marks)
c- Sequence and parasequence. (6 marks)
d- Type 1 and Type 2 sequence boundaries. (6 marks)
- 2- Write on **TWO** questions **ONLY**:
a- The effect of sea level changes on the evolution of systems tracts. (3.5 degrees)
b- The criteria of recognition of sequence boundaries. (3.5 degrees)
c- The difference between retrogradational and progradational stratal pattern in response to sea level changes and sediment flux. (3.5 degrees)

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

Prof. Dr. Mohamed Ahmed Soliman

Prof. Dr. Ahmed-Reda El Younsy

Assiut University
Faculty of science
Geology Department

Final Exam
Second Semester 2015-2016
Date: 23/6/ 2016



Time: 2 hrs

Subject: Well Logging (PG463) (fourth level)
for Petroleum Geology Group

Total 50 marks

Answer The Following Questions

1. A. What are ? : (4½ marks)

- i) The formation resistivity factor.
- ii) The main parts of a logging tool.
- iii) The hydrogen Index.

B. Write the formulas used for estimating the following: (6 marks)

- i) Liquid junction potential.
- ii) Water and hydrocarbon saturations.
- iii) Shale volume from GR log.
- iv) Mud cake thickness.

2. Give shortly the reason of FOUR ONLY of the following: (10 Marks)

- a) Resistivity variations of rocks.
- b) When gas is present, the neutron log will read too low porosity.
- c) In case of density logs, the counts of detectors increase with increasing porosity.
- d) SP tool won't record anything against evaporite formation.
- e) Mud cake is an indicator of permeability.

3. Demonstrate by sketches the use of well logs in detecting FOUR ONLY of the following: (10 marks)

- a) Gas-oil and oil-water contacts.
- b) Overpressure zones.
- c) Gas influx.
- d) Breakout and washout features.
- e) Facies of clastic rocks.

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4. Explain how only TWO of the following are accomplished: (4 marks)

- Detection of hydrocarbon source rocks by resistivity, density and GR logs.
- Discrimination of different carbonate and evaporite rocks using combination of density and neutron measurements.
- Permeability estimation from well logs.

5. Compare using sketches between density and induction sondes, in a table including the following items: (12½ marks)

- a) The measured quantity.
b) Energy sources in tool.
c) Type and number of detectors.
d) Tool centralization.
e) The relation for porosity estimation from the tool readings.

6. Put (✓) inside the brackets against the correct answer: (3 marks)

i) The effect of shale and gas on the neutron tool is:

- a) Similar effect, each causing the tool to read high value. ()
b) Opposite effect, shale causing the tool to read low and gas causing it to read high value. ()
c) Similar effect, each causing the tool to read low value. ()
d) Opposite effect, shale causing the tool to read high and gas causing it to read low value. ()

ii) Which of the following log readings may indicate an oil bearing formation?

- a) Low resistivity and high SP. () b) High gamma ray and low SP. ()
c) High resistivity and high SP. () d) Low gamma-ray and high SP. ()

iii) Focusing of resistivity tools aims at minimizing the effect of :

- a) The borehole. () b) The mud cake. () c) The invaded zone. ()
d) All of the above. () e) None of the above. ()

[illegible]

Good Luck !!

Examiners: Prof. Dr. Awad A. A. Omran

Assiut University



Faculty of Science

Geology Department

Final Examination for B Sc. Students

ECONOMIC GEOLOGY (G 434)

Total Marks (50)

June 2016

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. I

(Total 20 Marks)

1- A Iron ore deposits are formed via different processes; What are these processes? Where iron deposits occur in Egypt? . Specify the genetic mode of formation in each locality. Do you think that Egyptian iron ore reserves enough to cover the demands on steel industry for the coming 20 years? If not What is your suggesting solution?

(7½- Marks)

1- B How gold mineralization fit to the plate tectonic evolution of the Nubian Shield? Why gold is almost found concentrated along shear and fracture zones at the immediate vicinity with the host rock? How gold precipitation mechanism goes? Summarize the chief mode of formation (genesis) for four important localities that are exploited for gold in Egypt , illustrating the mode of gold formation in each locality and give their approximately average gold content (grade, g/t) (7½- Marks)

C What factors you must take inconsideration in evaluation of an ore potentiality ? and What factors you should apply on evaluating the ore recovery? (5- Marks)

Answer Only TWO Questions from the following

Question No.2

(Total 15 Marks)

2- A Explain in some details the common and recent ideas for the formation of pegmatites. How you explain zoning in pegmatites? What is meant by: S-type and I-type granites? What are the characterization of the so named: G1 ,G2,and G3 Egyptian granites?. Mention their known common associated ore minerals .

2- B- How magma acquired high sulfur content? What kind of ore mineralization that can be formed in this magma? Where you can look for these ores in Egypt? And Where their famous world economic productive countries?

(Continued over Leaf)

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Question No.3

(Total 15 Marks)

3- A What are the fundamental alterations used ,as practical guides, in prospection of hydrothermal deposits? What are the evidences for fissure filling hydrothermal deposits? and What are their common forms ? What criteria you take in your consideration in prospecting for copper porphyry deposits? Where are the most important occurrences for copper mineralization in Egypt? What are the genetic differences between stratiform Volcanic Massive Sulfide (VMS) deposits and Sedimentary Exhalative (SED-EX) deposits? Where do these deposits occur in Egypt, and Where their known famous world deposits occur?

3-B What are the important ores or/minerals that genetically related to metamorphic process ?Where these deposits occur in Egypt? Discuss its common uses.

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Question No.4

(Total 15 Marks)

4 - A What factors controlling and limiting the development of oxidation zone? What types of ores you look fore in the oxidation zone? Elucidate your answer with chemical equations. What are the main factors that control uranium concentration, mobility and deposition in this zone.

4- -B Brine evaporates are formed from different types of waters. What are these types? and What are the requirements for the formation of salt deposits? From Where the Egyptian natural evaporate wealth resource comes? What are the normal paragenetic sequences of an evaporate assemblage from a sea water brines? In the framework of the plate tectonic theory; ore & mineral deposits distribution in Egypt ; How can you interpret the occurrences of the most famous Egyptian deposits in relation to the different plate tectonic setting models. (Elucidate your answer with drawings)

و بالتوفيق

Examiner: Prof. Dr. Nadia Sharara

Good Luck



Time: 2 hrs Subject: Well logging and Structural Analysis (G444) Total 50 marks
for Geology Group Students

Part I - Well Logging (25 marks)

Answer the following questions:

1) Define the following expressions: (4 marks)

- a) Hydrogen Index. b) Formation resistivity factor. c) Electron density.

2) Complete the sentences: (4 marks)

- a) Two formulas for estimating permeability from well logs are as follow
- b) The resistivity of a rock may change due to

3) Put (✓) inside the brackets against the correct answer(s): (3 marks)

i) The effect of shale and gas on the neutron tool is:

- a) Similar effect, each causing the tool to read high value. ()
- b) Opposite effect, shale causing the tool to read low and gas causing it to read high value. ()
- c) Similar effect, each causing the tool to read low value. ()
- d) Opposite effect, shale causing the tool to read high and gas causing it to read low value. ()

ii) Which of the following log readings may indicate an oil bearing formation?

- a) Low resistivity and high SP. () b) High gamma ray and low SP. ()
- c) High resistivity and high SP. () d) Low gamma-ray and high SP. ()

iii) Focusing of resistivity tools aims at minimizing the effect of :

- a) The borehole. () b) The mud cake. () c) The invaded zone. ()
- d) All of the above. () e) None of the above. ()

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- 4) **Compare between** sonic and induction (EM) tools, showing their components, position in borehole, the measured property and use in porosity estimation. (6 marks)
- 5) **Demonstrate by means of sketches the use of well logs in detecting FOUR ONLY of the following:** (8 marks)
- Lithology and porosity from density and neutron logs together.
 - Facies of clastic rocks.
 - Gas influx and washout features.
 - Hydrocarbon source rocks.
 - Breakout and overpressure zones.

Write Short Notes on:

[illegible]

Examiners: *Prof. Dr. Awad A. A. Omran*
Prof. Dr. Mohamed A. Hassan



Final Exam of Environmental Geology (402GP)

For 4th year students- 2016

June , 16 , 2016

Time: Two Hours

Total marks: 50

Examiner : Prof. Mamdouh Farrag Soliman

الامتحان في أربع صفحات

I- (Questions 1-24,

1.5 marks for each);

أجب في نفس ورق الأسئلة

Select the letter (a, b, c, d, or e) of the choice that BEST answers the question. Each question has ONLY one correct answer.

1-The three heat sources of the earth combined lead to raise the earth's internal temperature enough that *most of it melted*,

- a. It was probably never molten all at once.
- b. Dense materials, like *metallic iron*, tended to sink toward the middle of the earth.
- c. *lighter, low-density minerals crystallized and floated out toward the surface*.
- d. The result was an earth differentiated into several major compositional zones: the Core; the Mantle; and the thin Crust at the surface.
- e. All above

2- Oceanic lithosphere:

- a. is made of alternating bands of rocks of different compositions.
- b. is made of alternating bands of rocks of two different ages.
- c. is made predominantly of granite and other low density rocks.
- d. moves gradually toward the mid-ocean ridges, where it is consumed.
- e. is made predominantly of basalt that gets older the farther away from the mid- ocean ridge it is

3--A system can be defined as.....
.....
.....

4-The fact that the Earth is a closed system has two important implications for environmental geology, mention them?
.....
.....
.....

5-Heat reaches the bottom of the lithosphere by

- a. conduction
- b. convection

6-Mountain ranges such as the Alps or Appalachians grow when fragments of moving lithosphere

- a. have a collision
- b. have a diversion
- c. have a disintegration

7-Transform fault margins are frequent sites of

- a. Intermediate earthquakes
- b. powerful earthquakes
- c. weak earthquakes.

8. Divergent margins are frequent sites of

- a.** Intermediate earthquakes **b.** powerful earthquakes **c.** common but weak earthquakes.

9- Convergent margins are often marked by

- explosive volcanism and powerful earthquakes
- powerful earthquakes but are not associated with volcanism.

10-Angle of Repose is.....

11-Topple-is

- Topple-is**
- free vertical drop of material from a cliff or steep slope.
 - a block turning round
 - mass sliding along well-defined failure surface
 - all above

12-The factors that influencing creep process are

a-.....

b-.....

C-.....

13-Slump is:

- a. downward sliding of material
- b. moves as a whole section on curved surface
- c. usually slow, material doesn't go far
- d. commonly due to slope over-steepening
- e. often involves multiple blocks
- f. all above
- g. non from above

14-Slurry flow can divide to

- a. mudflow flow and debris flow
b. earth flow and granular flow
c. debris flow, mudflow and solifluction
d. non from above

15-Slope Remediation Techniques involve:

a-.....

b-.....

C-.....

16-Contaminants in surface water come primarily from:

a-.....

b-.....

C-.....

d-.....

17-When aquatic organisms die; the water usually turns green and muddy looking; and the entire system stagnates. This process is called

- a. Eutrophication b. *aerobic* environment c. acidification

18-When the growth of plankton and algae is uncontrolled, a situation called

- a. An *algal* eutrophication b. an *algal bloom* c. an *algal* mass

19-Acid mine drainage can cause acidification of

- a. surface water bodies b. Groundwater c. Both d. Non

20-A potentially serious contaminant of groundwater has four basic characteristics, these are:

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

21- Booms are:

- a- long floating tubes or barriers that are put on the water surface to contain an oil spill
b- They help to contain the oil slicks *بقع* on the ocean surface
c- Some of them are fire resistant water
d- All above e. Non from above

22- Dispersants are

- a. long floating tubes or barriers that are put on the water surface to contain an oil spill (usually to protect the shoreline.)
b. They help to contain the oil slicks *بقع* on the ocean surface
c. Some of them are fire resistant water
d. All above
e. Non from above

23-In situ burning of oil spill requires minimal equipment and some specialized equipment such as

- a-
b-

24-Three distinct approaches to physical recovery of an oil spill by Mechanical method. One of them is:

- a- The use of chemical dispersants
b- The use of sorbents
c- In situ burning of oil spill

II- Answer only 3 from the following : (5 marks for each)

أجب في كراسة الإجابة

1- Discuss briefly: The energy cycle

2- Discuss in details the pollution of groundwater by Sewage (Septic Systems)

3- The life on the earth has had an intense influence on the chemical evolution of the Earth's lithosphere and atmosphere. Explain that?

**4- The mass movement types include; Fall, Topple, Slide and Flow
Discuss in details the flow of different materials ?**

*** Good Luck ***

Prof. Dr. Mamdouh Farrag Soliman



الأمتحان النهائي للفصل الدراسي الثاني للعام الجامعي ٢٠١٥-٢٠١٦

جامعة أسيوط
كلية العلوم
قسم الجيولوجيا

المستوى الرابع (شعبة الجيولوجيا)

الزمن: ساعتان

أسم المقرر: بيئة الأحياء القديمة وطباقية حياتية ٤١٤ ج

Part I: Biostratigraphy

Question no. 1: (5 marks; 2.5 each)

Define **two only** from the following:

- 1- Rewarded fossils
- 2- Concurrent Range Zone
- 3- Excursion Taxa (give an example)
- 4- Interzones and Intrazones hiatus

Question no. 2: (5 marks; one mark each)

Complete the following sentences:

- 1- Biohorizon is defined as.....
- 2- *Thoracosphaera operculata* is considered the best example for..... Zone
- 3- Graptolites are important index fossils during.....and became extinct by.....
- 4- The GSSP is defined as.....
- 5- The Ammonites are very important for age dating the sedimentary strata of..... age.

Question no. 3: (10 marks)

- 1- Determine the geologic ages of the given calcareous nannofossils species:

Microhabdullas furcatus – *Brinsonia parca parca* – *Quadrum sissinnghii* – *Tranolithus phacelosus* – *Rinherdtite levis* – *Micula murus* – *Micula decussate* (5 marks)

- 2- Arrange the above species from older to younger based on the identified geologic ages.

(2.5 marks)

- 3- Could you infer any stratigraphic hiatus (2.5 marks)

Question no. 4: (5 marks)

Discuss two only from the following:

- 1- Danian/Selandian boundary (lithostratigraphic and biostratigraphic characteristics).
- 2- Biostratigraphic events.
- 3- Types of evolution.
- 4- Rules of the GSSP.

أنظر خلفه

Part II: Paleoecology

Question no. 1: Write briefly on **five only** from the following:

(10 marks; 2 marks each)

Autecology and synecology – Differential preservation – Substantive uniformitarianism – Necrology
– Database in paleoecologic interpretations – taxonomic uniformitarianism -

Question no. 2: Answer **two only** from the following:

(5 marks; 2.5 marks each)

- 1- Morphology of Ostracod shells might reflect substrate turbulence and locomotion method, discuss this statement.
- 2- Stromatolite morphology is influenced by turbulence, explain and illustrate your answer by drawings.
- 3- Dinoflagellates are good indicators for the paleoenvironment and are frequently used by paleoecologists, why?

Question no. 3: Complete the missing word(s):

(5 marks; one mark each)

- 1- The study of the processes that take place after an organism dies but before its final burial is called.....
- 2-grow on the sediment surface, they trap sediments and sometimes cause precipitation of Ca CO_3 as result of photosynthesis.
- 3- involves all of the processes responsible for lithification of the sediment and chemical interactions with waters residing between clasts.
- 4- Relative and quantitative percentage data-sets in paleoecologic resolution differ in
- 5-are salinity tolerant.

Question no. 4: Write in detail on the environmental tolerance of diatoms. **(5 marks)**

أنتهت الأسئلة والله الموفق

Examiners: Prof.Dr. Magdy S. Mahmoud; Dr. Amr Abdel-Sabour Abdel-Hameed

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 يونيو 2016

ملحوظة: الإمتحان يقع في ثلاث صفحات

Part I (PreCambrian) 10 Markes

Question 1:

Write on the following items:

- 1- The different mechanisms proposed to explain the exhumation of the gneiss domes exposed in the Egyptian basement.
- 2- Dokhan Volcanics and Island arc Volcanics exposed in the Eastern Desert of Egypt.

Part II (Cambrian to L. Cretaceous) 10 Marks

Question 2(A-C) :

2-A : In a stratigraphical table summarize the Paleozoic rock units at Gebel Uweinat and north Western Desert .

2-B: Correlate and compare in a cross section between the Early Cretaceous sediments at Sinai and north Western Desert.

3-C: Define the geological age and the geographical location of only FOUR of the following:

i- Wadi Natrun Formation

ii- Abu Roash Formation

iii – Eghi Group

iv- Maghrabi Formation

v- Um Barmil Formation

Part III (Upper Cretaceous to Quaternary) 20 Marks

Answer TWO Questions of the following:

Question 3:

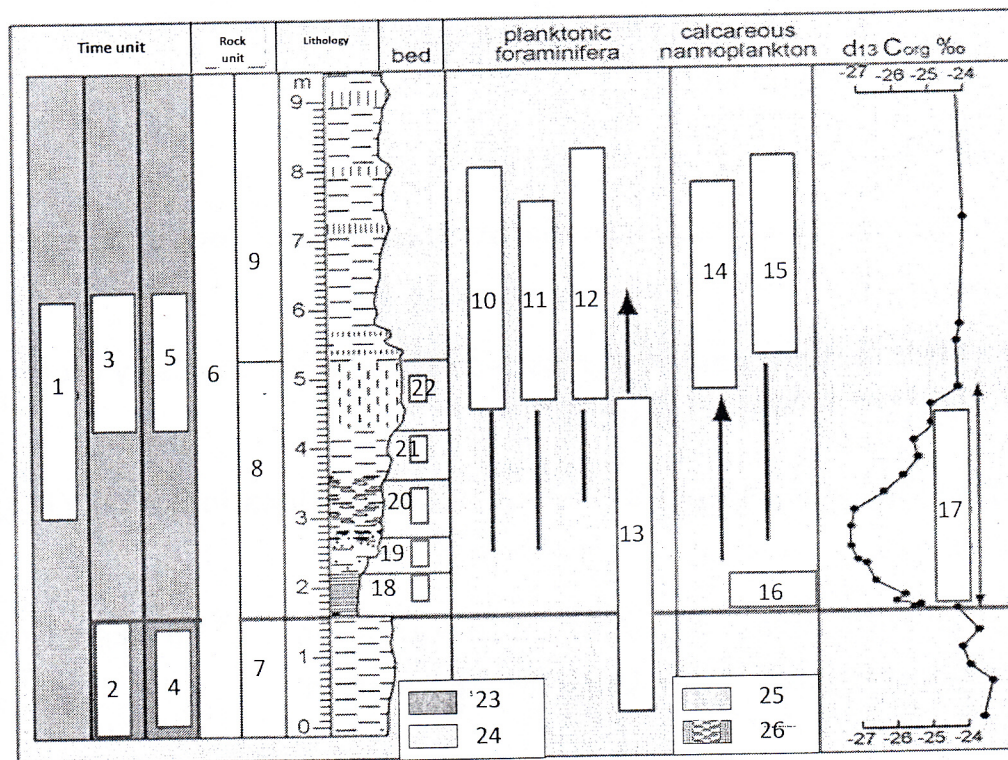
3: Define stratigraphically in a time table the different rock units of the Oligocene-Miocene Series in the Gulf of Suez region and correlate them with those of the northern onshore of the Red Sea coast. (10 Marks).

Question 4:

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

Question 5:

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).



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

Answer the following question:

Question 6 (A&B) (10 Marks)

6-A: Give short notes about the following items: (3 Marks).

- i- The difference between crude oil, natural gas and condensates
- ii- The quantity of Production of crude oil, natural gas and condensates in Egypt during 2008-2009
- 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

6-B: Define graphically 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. (7 marks)

Good Luck.

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

بسم الله الرحمن الرحيم

جامعة أسيوط

كلية العلوم

قسم الجيولوجيا

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 يونيو 2016

الإمتحان مكون من أربعة صفحات

Part I (PreCambrian) 10 Markes

Answer the following question using drawing when possible:

Question 1:

Outline in detail the ophiolite sequence in the Egyptian basement regarding the origin, metamorphism and the tectonic setting. (10 Marks)

Part II (Cambrian to L. Cretaceous) 10 Marks

Answer the following question:

Question 2(A-B):

2A- Write briefly on the Paleozoic rocks in Egypt. (6 Marks)

2B- Discuss the lateral variations in the facies of the lower Cretaceous rocks in Sinai . (4 Marks)

Part III (Upper Cretaceous to Quaternary) 20 Marks

Answer **TWO** Questions of the following:

Question 3(A-B):

3A- Correlate stratigraphically in a time table the Oligocene-Miocene rock units of the northern Western Desert and the Nile Delta. (6 Marks)

3B- Write a short account on **ONE** of the following items: (4 Marks)

- a) The Nubia Sandstone at Aswan
- b) The Phosphate deposits in southern Egypt

Question 4:

4-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. (10 Marks)

Question 5 A &B:

5A- Select from list B the equivalent rock units to those of List A and rearrange the units of list A in stratigraphic order according to their age. (5 Marks)

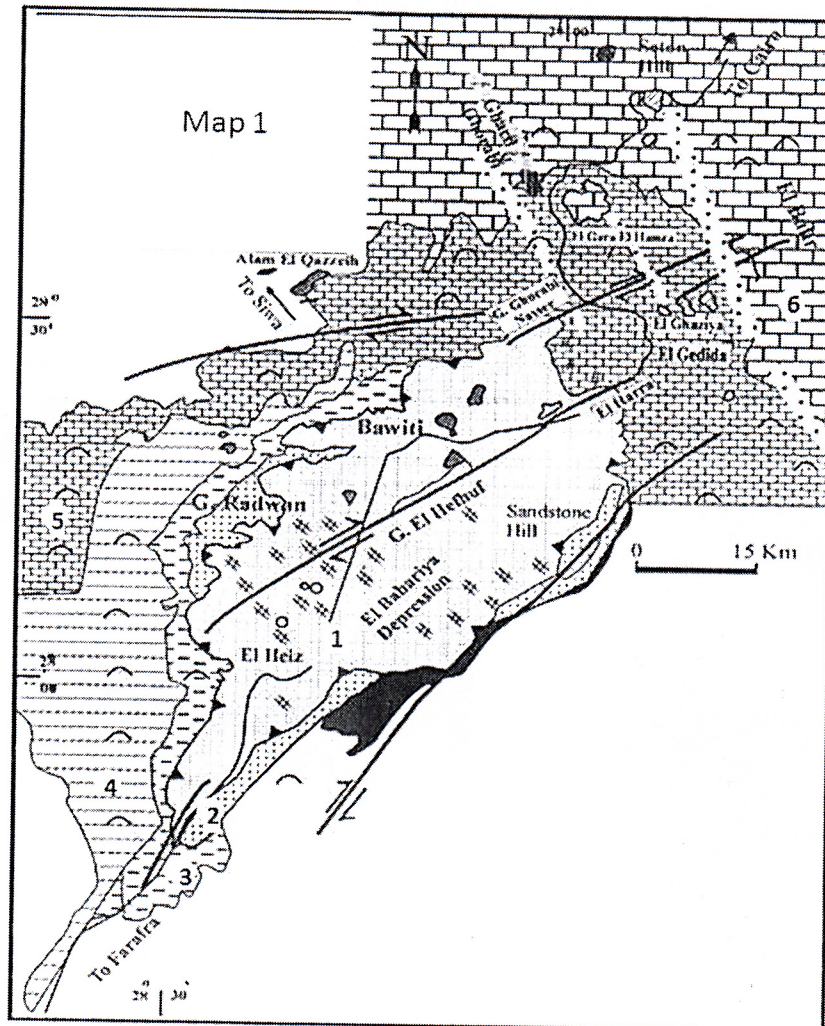
List A

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

5B: Look to the following map and define: a) the name of district, b) the names of rock units and their equivalent ages which are given on map from 1 to 6. (5 Marks)



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

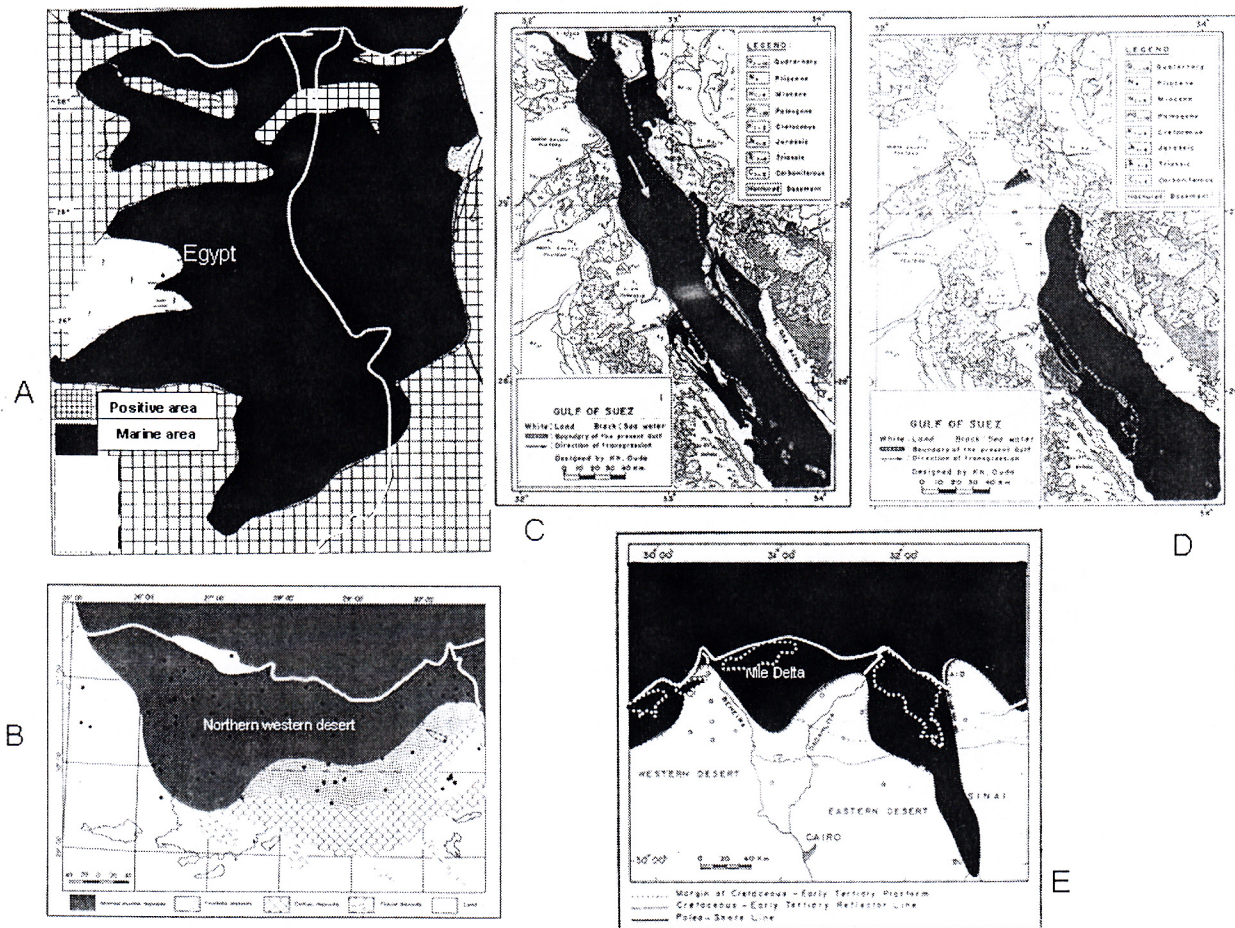
Answer the following question:

Question 6 (A-C)

6-A: Write briefly on the granitoid rocks exposed in the Egyptian basement. (3.5 Marks)

6-B: Compare between the Cenomanian sediments in Sinai and Bahariya Oasis (2.5 Marks).

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



Second Semester Final Examination –

Subject: Sandstone and carbonate reservoirs (PG 462)

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

PART I: SANDSTONE RESERVOIR

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) Where clay rims are thick, they may inhibit later cementation and so preserve porosity ().
- 2) The early precipitation of calcite cements in sandstones permits later quartz overgrowth formation and feldspar alteration to clays ().
- 3) The precipitation of clay minerals and zeolites in sandstone increase its permeability and porosity ().
- 4) Fracture porosity is a form of secondary porosity generated by tectonic fracturing of the rock ().
- 5) For authigenic feldspar, acidic pore waters rich in Na^+ or K^+ , Al^{3+} and Si^{4+} are necessary ().
- 6) Pyrite is commonly altered to goethite/limonite on surface weathering ().
- 7) Effective porosity is the total void space in the rock whether or not it contributes to fluid flow ().
- 8) The precipitation of quartz overgrowths usually is the first diagenetic event, often pre-dating clay rims ().
- 9) Feldspar grains in mature sandstones are more common than quartz ones ().
- 10) Micro-porosity is that part of the pore space that has a characteristic dimension less than 1 micron ().

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

Write on the following:

- i) The parameters that affecting the reservoir quality in sandstones. (4 marks)
- ii) Composition and classification of sandstones. (7 marks)
- iii) Carbonate cementation in sandstones. (4 marks)

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

Write on the following:

- i) Compaction and pressure dissolution in sandstones. (5 marks)
- ii) Definition, classification and factors controlling the reservoir porosity. (6 marks)
- iii) Compare briefly between the following: (4 marks)
 - a) Absolute porosity and effective porosity.
 - b) Intergranular porosity and Intragranular porosity.
 - c) Reservoir rock and source rock.
 - d) Porosity and permeability in rocks.

أنظر خلفه

باقي الأسئلة في الصفحات التالية

PART II: CARBONATE RESERVOIRS (25 MARKS)

Answer only **Five questions** out of the following, extra answers will not be considered.

1. Write in detail on the different types of carbonate reservoirs (5 Marks).

2. Write short notes on (5 Marks):

A. Give the following limestone types their appropriate names according to classification of Folk 1959, 1962 and classification of Dunham 1962 (2.5 Marks).

- 10% pellets, 15% gastropods, 20% intraclasts and 25% micrite, 20% sparite.
- 10 % intraclasts, 30% pelecypods, 10% dolomite, and 50% micrite (more than 15% of rock components > 2mm).

B. Stylolites as a diagenetic feature (2.5 Marks).

3. Write short notes on (5 Marks):

A. Rimmed shelf types (2.5 Marks).

B. Compare between intertidal-supratidal flats and lagoons with respect to lithology, sedimentary structures and fauna (2.5 Marks).

4. Put the name of the appropriate scientific term in the following spaces (5 Marks):

A.would mix the sediment and gives a more isotropic character to the pore system (1 Mark).

B.is a variety of interparticle porosity where a broad platy grain has provided an umbrella for the area beneath, to protect it from filling with finer interstitial detritus as it settles (1 Mark).

C. The opposite of aggrading neomorphism is where large crystals of CaCO_3 are replaced by smaller calcite crystals (1 Mark).

D. is a gently sloping surface ($< 1^\circ$) on which nearshore wave-agitated sandy facies pass offshore into deeper-water, more muddy facies (1 Mark).

E. are spherical, cylindrical or angular grains, composed of micro-crystalline carbonate, but with no internal structure (1 Mark).

5. Fill in the following spaces with suitable words (5 Marks):

A. To preserve primary porosity, the sediment has to have, and (1 Mark).

B. Diagenesis in limestones is often referred to as, when there is no major change in chemistry of the sediment in its transformation into a rock, and when chemical changes are involved (1 Mark).

C. Rimmed shelf margins respond in different ways to sea-level change. James and Mountjoy (1983) identified five types: 1 2 3 4 and 5 (1 Mark).

D. Environmental factors, such as,,, and, controlled the distribution and development of the organisms in the various carbonate subenvironments at a point in time (1 Mark).

E. The depth at which the rate ofof calcium carbonate is balanced by the rate of is known as the carbonate compensation depth (CCD) (1 Mark).

6. True or false:

A. Where fluids flow unequally in all directions, the permeability is isotropic, but if there is a preferred flow direction, then permeability is said to be anisotropic (1 Mark).

B. Micritization of skeletal grains by endolithic algae is a neomorphic process of course and does result in a fine-grained mosaic (1 Mark).

C. Rimmed shelves are characterized by the development of pelagic environment and supratidal sabkhas along the shelf margin (1 Mark).

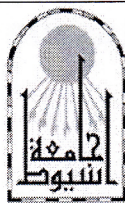
D. Vuggy porosity is regular primary (dissolution) holes that cut across grains and/or cement boundaries (1 Mark).

E. Carbonate muds are accumulating in many modern environments such as tidal flats, shallow lagoons and deep sea floor (1 Mark).

GOOD LUCK

Dr. Abdalla El Ayyat

Dr. Mahmoud A. Essa



Answer the following questions:

(50 Marks)

1. Mark each statement as true (✓) or false (×):

(5 Marks)

- () The resistance of organic matter does not depend on sediment accumulation rate.
- () Aquatic organisms such as algae and phytoplankton are better quality- kerogen producers.
- () Oil shale deposits formed in shallow seas are much thicker than those accumulated in large lake basins.
- () The most important oil shale deposits in the world are of Devonian age.
- () Kerogen III is mainly derived from higher plants.

2. Discuss in details the formation and thermal maturity of kerogen, *illustrate your answer with drawings.*

(8 Marks)

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3- Write short notes on the influential factors of oil shale retorting.

(5 Marks)

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4- Illite/Smectite (I/S) is a reliable geothermometer model used to depict the maturity of the hydrocarbon-bearing rocks, *write short notes on this statement.*

(5 Marks)

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5- Compare between the Cretaceous oil shale of Abu Tartur and Red Sea areas.

(5 Marks)

	Abu Tartur	Red Sea
Stratigraphic position		
TOC		
Kerogen type		
Oil yield		

6- Answer only ONE of the following:

(2 Marks)

A- Compare between the autochthonous and allochthonous organic matter.

.....

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.....

B- What is the difference between lean and rich oil shale?

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7- Write short notes on the characteristics of oil shale accumulated on large lake basin.

(5 Marks)

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8- Answer only ONE of the following:

(5 Marks)

A- Compare between Liptinites, Exinites and Intertinite.

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B- Total organic carbon (TOC) varies considerably in sediments, *what are the limits used to discriminate between the hydrocarbon potential varieties?*

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9- Write short notes on the *advantages* and *disadvantages* of vitrinite reflectance.

(4 Marks)

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10- Write briefly on the methods used to estimate the grade of the oil shale.

(2 Marks)

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.....

11- Color of organic matter is applied to depict its thermal maturity, *explain this statement.*

(4 Marks)

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Final Examination, Hydrogeology 1

June 2016	Hydrogeology 1 (460G)	25 Points	Time: 1 Hour
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Give your answers on the given papers and back of it

Support your answers with drawings when applicable

Answer the required questions only to save your time

I. Answer the following question (8 points)

Water resources in Egypt are represented by surface water and groundwater. Groundwater in Egypt is found in different aquifers. On the light of this sentence, describe the different groundwater aquifers in Egypt:

(Use illustrations to support your answer)

II. Define only two of the following (support the answers with drawings) (2 points)

A)- Mechanical dispersion

B)- Flownet

C)- Aquifer test

III. Compare between Darcy velocity and seepage velocity..... (2 points)

IV. List only six simplifying assumption of Theis's solution..... (3 points)

V. Choose the correct answer of the following: (10 points)

1. The existence of substances within water that is not necessarily harmful refers to:
 - a. water use
 - b. water quality
 - c. water pollution
 - d. water contamination
2. A water sample has a TDS of 3500 mg/l is representing:
 - a. Seawater sample
 - b. Fresh water sample
 - c. Rain water sample
 - d. Brackish water sample
3.of a porous media is the ratio of velocity to hydraulic gradient.
 - a. Darcy velocity
 - b. Transmissivity
 - c. Hydraulic conductivity
 - d. Porosity
4. If two streams X and Y provide the same volume of water, stream X has lower flux than stream Y, the mean resistance time for both would be:
 - a. $X = Y$
 - b. $X > Y$
 - c. $X < Y$
 - d. None of the above
5.is the amount of alkali in the form of bicarbonates, carbonates and hydroxides present in the water.
 - a. Total Hardness
 - b. Total Dissolved Solids
 - c. Total Suspended Solids
 - d. Total Alkalinity
6. The drawdown in a confined aquifer is distinguished by:
 - a. decline of water table
 - b. decline of potentiometric surface
 - c. decline of ground level
 - d. decline of phreatic level
7. The size and shape of the cone of depression and the rate of drawdown are directly related to:
 - a. Storativity and porosity
 - b. Specific yield and porosity
 - c. Transmissivity and porosity
 - d. Transmissivity and Storativity
8. Piper diagram is useful in.....of chemical data and interpret their:
 - a. visualization, places
 - b. storing, depths
 - c. storing, levels
 - d. visualization, origin

An advective contaminant plume found its way to an aquifer. Given that the linear advective velocity from the plume source to its end is 2.16 m/d (the head difference is 2 meters), the hydraulic conductivity for this aquifer is 5×10^{-4} m/s and the effective porosity is 20%, answer the following questions.

9. What is the horizontal length of this plume?

- | | |
|----------|----------|
| a. 100 m | c. 250 m |
| b. 150 m | d. 200 m |

10. What would be the velocity of this plume if the horizontal length were 432 meters:

- | | |
|-------------|-------------|
| a. 1.0 m/d | c. 4.32 m/d |
| b. 1.08 m/d | d. 2.16 m/d |

Best wishes

Dr. Ahmed Seif



Final Examination, Petroleum Geology 1

June 2016	Petroleum Geology 1 (460G)	25 Marks	Time: 1 Hour
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I. Answer only 25 of the following questions: Put (✓) in front of the correct sentence and (X) in front of the wrong:..... (25 Marks)

- 1- The main Geophysical and Geological evaluation phase is carried out during the hydrocarbon Exploration stage ()
- 2- Sedimentary basins can only formed either due to flexure or lithospheric stretching ()
- 3- Rift basins are characterised by positive Bouguer anomalies ()
- 4- Seal and overburden rocks are main processes for a petroleum system ()
- 5- As accommodation space in a sedimentary basin is formed, we will accept that sediments will be deposited ()
- 6- If the permeability is too low to allow the water to escape at the rate of added overburden the fluid pressure increases and creates over pressure ()
- 7- Permeability is a measure of the capacity of a rock to transit fluids ()
- 8- If the escape of fluids keep pace with compaction over pressure builds and the sediment become over-pressured ()
- 9- Over pressure typically develops where sedimentation rates are high and where there are fine-grained and/or low permeability sediments present ()
- 10- The term Condensate is used for hydrocarbons that are liquid in the subsurface, but condensate to gas at surface condition ()
- 11- The biogenic break-down of the organic matter resulted in Methane ()
- 12- Organic rich sediments, source rocks, tend to be fine-grained rock types ()
- 13- The Gamma ray log reading is usually low for the organic rich shales ()
- 14- Kerogen is the organic material in sedimentary rock that is insoluble in organic solvents ()
- 15- Alginite is a maceral in Kerogen of fresh water algae sources ()
- 16- The position of an oil window depends highly on the type of organic matter ()
- 17- The average hydrocarbon saturation is one of the information needed to calculate oil in place ()
- 18- The net to gross is the ratio of non-reservoir to reservoir quality rock ()



كلية العلوم - قسم الجيولوجيا



جامعة أسيوط

امتحان طلاب المستوى الرابع (ساعات معتمدة)
مقرر (445 ج) جيولوجيا تصويرية واستشعار عن بعد
الدرجة الكلية (50 درجة)

الزمن : ساعتان

يونيو 2016

PART I: PHOTO GEOLOGY (25)

(Illustrate your answer with suitable drawings)

I. ANSWER THE FOLLOWING QUESTIONS: (10 marks)

1. Parallax measurements from stereo-models are used to calculate the height difference between points defined on aerial photographs using the equation :

$$(h_x - h_y) = (H - h) p / W$$

Where: $h_x - h_y = \dots\dots\dots$, $H = \dots\dots\dots$, $h = \dots\dots\dots$
 $p = \dots\dots\dots$, $W = \dots\dots\dots$ (5 marks)

2. Explain how the drainage patterns are essentially used in lithologic and structural photo-interpretation (5 marks)

II. GIVE SHORT NOTES ON TWO OF THE FOLLOWING: (8 marks)

- a) Explain how the vertical exaggeration is extremely important when one must estimate slopes, dips, strata thicknesses and fault displacements from stereo-models. (4 marks)
- b) Resistance to erosion as one of the characteristics that affect the appearance of sedimentary rocks on aerial photographs. (4 marks)
- c) Scale variation caused by relief (4 marks)

III. Write briefly on the photogeologic characteristics of TWO of the following: (7 marks)

- A) Granitic Rocks B) Limestones C) Sandstones

PART II: REMOTE SENSING (25)

Answer **TWO** questions **ONLY** of the following, Illustrating your answer with diagrams:

1. Comment on:

Lineaments - Hydrothermal alteration halos

2. Write briefly on:

Ratio image - Landsat image structure

3. Describe what you know about:

Landsat pixels - Uranium sedimentary deposits

GOOD LUCK!

Prof. Dr. Moustafa M. Youssef

Prof. Dr. Mohamed E. Habib