



2016-2017 Summer Semester, Final Examination for 4th Level Geophysics Students
On: Petrophysics and Well Logging (459-G)

August 2017	(Total Marks: 50)	Time allowed: 2 hours
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Answer the following questions:

First Question: The following is a log suite from a reservoir sequence in a specific field.

Address the following: (10 marks)

1. Identify if hydrocarbons/fluids are present and if so divide into zones/depth intervals.

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2. What are individual fluids?

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3. Identify the contact levels or depths of the individual fluids.

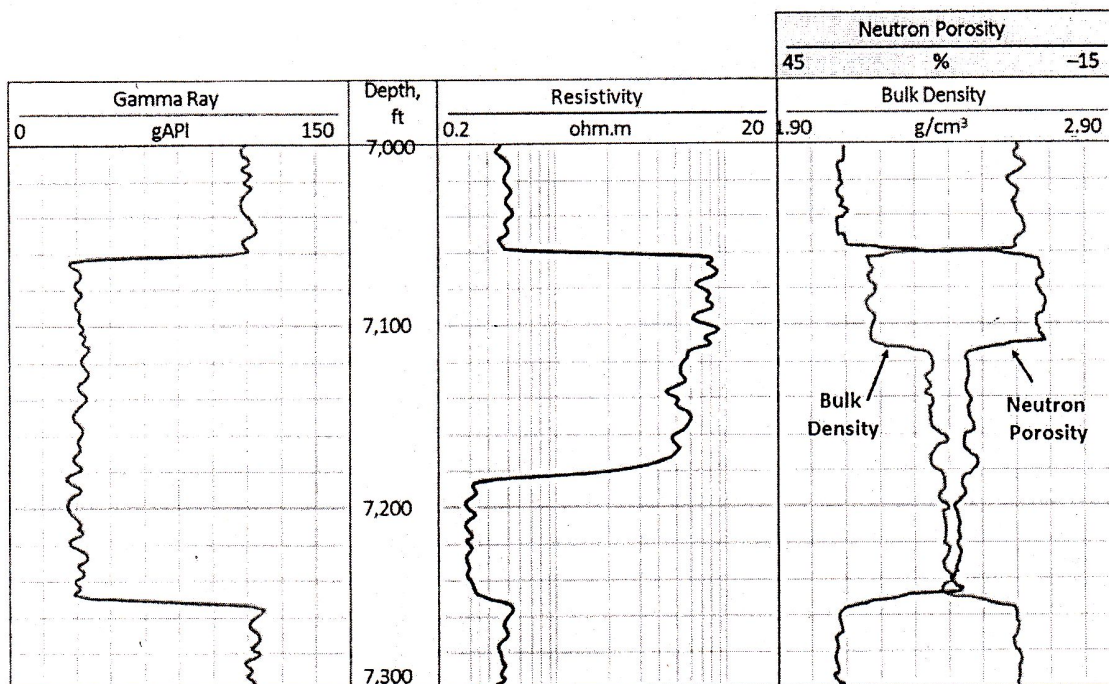
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4. What is the gross sand thickness of the reservoir?

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5. What is the net pay of the reservoir?

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5. Horner plot and Bottom-Hole Temperature (BHT) correction

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6. Diffusion (liquid-junction) potential

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7. Compensated neutron log (CNL) tool

Second Question: Write short notes on ONLY FIVE of the following (Use Sketches when it possible to support your answer): (20 marks)

1. Factors governing the magnitude of porosity

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2. Principal functions of drilling fluids

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3. Zones of invasion and resistivity profiles

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4. Discrimination between washout and breakout from Caliper log

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Third Question: Choose the correct answer.

(10 marks)

1. You are given the gamma-ray log on a well which has been drilled through a siliciclastic sequence. The gamma-ray reading of a clean sand is 20 API units and the shale baseline has a reading of 120 API units. The gamma-ray shale index of a formation is 0.25. The gamma-ray reading across this formation is? (3 marks)
a. 25 API units b. 35 API units c. 45 API units
2. Instead of sensors being lowered into the well at the end of wireline cable, the sensors are integrated into the _____ and the measurements are made while the well is being drilled.
a. Kelly drive b. Drilling rig c. Drill string
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. Which of the following log is used for depth matching and well to well correlation while running with other logs?
a. Gamma-ray log b. Gamma-gamma log c. Neutron log
5. Gamma ray logs can be recorded in:
a. Cased holes b. Open holes c. Both of them
6. A log that helps in finding the fractured porosity is:
a. Neutron b. Density c. Sonic
7. Which Resistivity logging tool is able to identify the thin beds sharply?
a. Laterolog b. Induction log c. Micro-spherically focused log
8. Which type of resistivity tool can be used in a well which has been drilled with oil-base mud?
a. Laterolog b. Induction c. Either Laterolog or Induction

Fourth Question: For ONLY FOUR, illustrate by equations the estimation of the following parameters using the accompanied well logs: **(10 marks)**

1. Formation water resistivity (SP log)

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2016-2017 Summer Semester, Final Examination for 4th Level Students

On: Well Logging (463-PG)

August 2017	(Total Marks: 50)	Time allowed: 2 hours
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Answer the following questions:

First Question: You are provided with a set of logs from a reservoir sequence in a specific field. The manager has asked you to analyse the log and address the following questions:

(10 marks)

1. Identify if hydrocarbons are present and if so between what depth intervals?

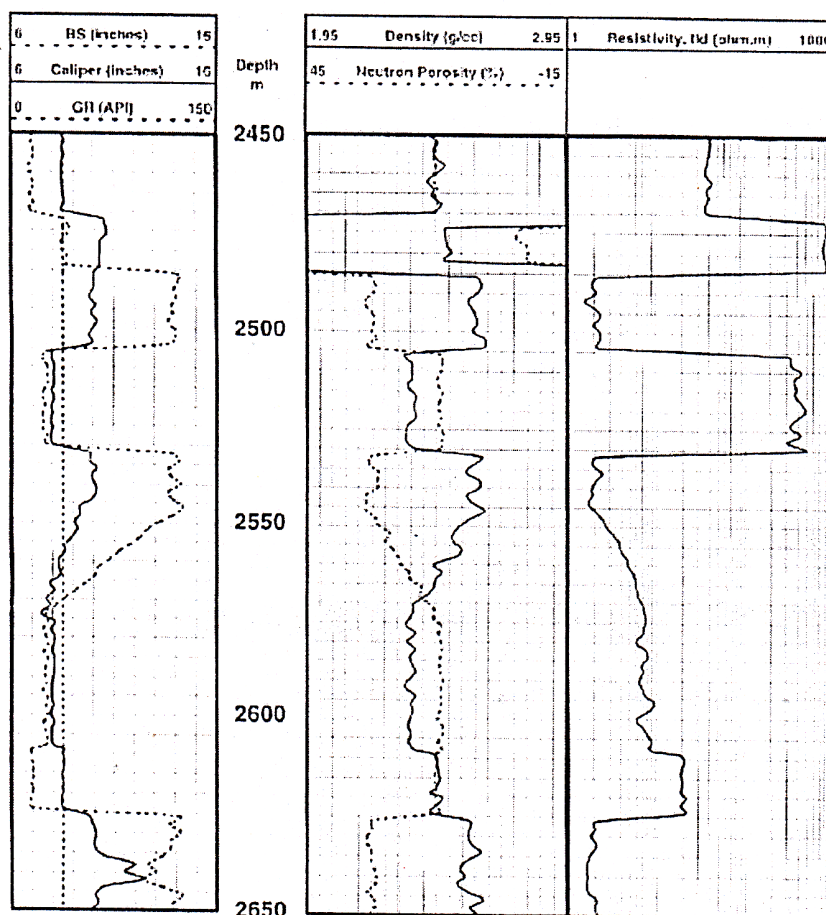
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2. If there is hydrocarbon present, does it exist as oil or gas?

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3. If there is water present, identify the hydrocarbon-water contact.

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Second Question: Write short notes on ONLY FIVE of the following (Use Sketches when it possible to support your answer): **(20 marks)**

1. Classification and functions of drilling fluids

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2. Density log: Its theory and the measured tool

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3. Discrimination between washout and breakout from Caliper log

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4. Electrochemical potential

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5. Factors influencing spontaneous-potential (SP) measurements

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6. Uses of spectral gamma-ray logs

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Third Question: For ONLY FOUR, illustrate by equations the estimation of the following parameters using the accompanied well logs: (10 marks)

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- [illegible]

- [illegible]

4. Geothermal gradient and formation temperature (Temperature log)

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5. Total porosity (Bulk density and sonic logs)

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

(10 marks)

1. The presence of oil does not affect the neutron tool response as it has approximately the same hydrogen index as fresh water. ()
2. Induction resistivity tool is preferred over latero-type tool in non-conducting muds. ()
3. The porosity of the flushed zone is larger than that of the uninvaded zone. ()
4. Positive SP is developed against reservoir section when salinity of formation water is more than that of mud filtrate. ()
5. Generally with resistivity tools the greater the spacing between the measuring electrodes the greater the depth of investigation. ()
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. Sandstones with K-feldspar, mica, glauconite produces low gamma-ray readings. ()
9. Neutron porosity increases with presence of gas. ()
10. High resistivity is always indicator of hydrocarbons. ()

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

Dr. Rashad Sawires

Assiut University



Faculty of Science
Geology Department

Final B Sc. Examination

ECONOMIC GEOLOGY (G 434)

August 2017 (Summer Course) Total Marks 50 Time allowed: Two hours

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 different sources of subsurface hydrothermal water? What are the requirements for the formation of metasomatic deposits? What are the common characteristic features of porphyry copper mineralization? Where are the most important occurrences for copper mineralization in Egypt? Mention the genetic mode of occurrences and the average Cu content (kg/t.) for each occurrence. (10 Marks)

B- How can you distinguish between Early magmatic and Late magmatic stage in ore forming processes? Mention only One ore deposits (of known economic potentiality) for each stage and mention Where its famous locality all over the world and its correspondence in Egypt. (5 Marks)

C- What are the main factors you must take in your consideration for evaluating the potentiality of an ore body and also for evaluating its ore recovery? (5 Marks)

Answer Only TWO Questions from the following

Question No.2

(Total 15 Marks)

A- What is meant by S-type and I-type granites.? What are the characteristics and the economic potentiality of the G1, G2 and G3 Egyptian granites? What important ores found in associations with them? and Where it do occur.? (5 Marks)

B- What are the most important factors affecting U mobility and U deposition during cycle of weathering and sedimentation? (5 Marks)

C- What are the requirements of formation of salt deposits?. Give the paragenetic sequences of the deposited evaporate assemblage in marine brine. From Where the natural Egyptian resource wealth comes? (5 Marks)

Continued on next page overleaf-

Question No.3

(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 only three important Egyptian gold bearing localities and give their average gold content (grade, g/t) (10 Marks)

B- What are the important economic ores or/ minerals that resulted from metamorphic process? Where these deposits occur in Egypt? (5 Marks)

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Question No.4

(Total 15 Marks)

A-Show How can you interpret the occurrence of the most famous Egyptian deposits in relation to the different plate tectonic sitting models that spatially related to crustal growth of the Egyptian Shield? Illustrate yours answer with drawings. (8 Marks)

B -How mantel derived magma acquired higher sulfur content? Give the name and the chemical formula for most common important ore minerals that may possibly produced in such conditions. (3½ Marks)

C-What is the recent idea for the origin of pegmatites? What are their characteristics textural and minerals compositions? Where its famous exploited localities in Egypt? (3½ Marks)

Examiner: Prof. Dr. Nadia Sharara

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2. Mud-cake thickness (Caliper log)

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3. Volume of shale (SP and gamma-ray logs)

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4. Total porosity (Bulk density and sonic logs)

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5. Porosity of gas-bearing formation (Density and neutron logs)

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

Dr. Rashad Sawires