



TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF GEOLOGY



EXAMINATION OF FOURTH LEVEL OF PMGP STUDENTS

COURSE TITLE	Interpretation and modeling of seismic data	Course Code: PMGE 4109		
DATE:	March 20, 2021	TERM: FRIST	TOTAL ASSESSMENT MARKS: 180	TIME ALLOWED: 2 HOURS

Answer the following questions (Illustrate your answers with clear drawings).

1. Choose the best answer

(تصحيح الكتروني)

(90 degree)

- 1) Seismic picking is a process should be done based on Petrel.....:
 - a) Plot window
 - b) Correlation window
 - c) Interpretation window
 - d) Mapping Window
- 2) The process that requires to collect the seismic picking, fault polygons, area polyout in one window to get the structure map called:
 - a) Make / Edit Surface
 - b) Coordinate system
 - c) Well correlation
 - d) Well Section
- 3) The first step to setup new petrel project is to define:
 - a) Seismic picking
 - b) Seismic attributes
 - c) Mapping and gridding
 - d) The project coordinates and units
- 4) The following information is the most important when loading a new well to Petrel
 - a) Well name
 - b) Well Coordinates
 - c) K.B
 - d) All the previous
- 5) A relationship required to show the formation tops in depth over the seismic section in time domain called:
 - a) Horizon\Fault
 - b) Well\Formation Top
 - c) Time\Depth
 - d) Volume\Surafce
- 6) The main input to calculate seismic volume attribute is:
 - a) Formation tops
 - b) VSP
 - c) Surfaces
 - d) Seismic Volume

- 2
- 7) The fault sticks should be interpreted based on:
 - a) Grid window
 - b) Seismic interpretation window
 - c) Well correlation window
 - d) Intersection window
 - 8) The fault polygons should be interpreted based on:
 - a) Grid window
 - b) Seismic interpretation window
 - c) Well correlation window
 - d) Intersection window
 - 9) It is a way we use for the seismic picking tool:
 - a) Manual picking
 - b) 2D auto-track
 - c) 3D auto-track
 - d) All the previous
 - 10) A tool we should use in order to draw the fault polygons:
 - a) Polygon editing tool
 - b) Make surface tool
 - c) Seismic attribute tool
 - d) Well tie tool
 - 11) Petrel™ software can integrate multiple data sets such as
 - a) Core data
 - b) Outcrops data
 - c) Seismic data
 - d) All of the above
 - 12) By using Petrel™ software we can make seismic interpretation for
 - a) Horizons
 - b) Faults
 - c) Polygons
 - d) All of the above
 - 13) In Petrel™ software well log data can be imported informat.
 - a) Doc
 - b) Ascii
 - c) Petd
 - d) Segy

14) The acoustic log is generally calibrated withbefore combining with the density log to produce acoustic impedance.

- a) check-shot
- b) Seismic data
- c) Well log data
- d) All of the above

15) There are many types of VSP survey except .

- a) Stable source VSP
- b) Zero-offset VSP
- c) Offset VSP
- d) Movable source VSP

16)is contouring variations in reflection time interval between two reflectors.

- a) Isochron maps
- b) Seismic Maps
- c) Isopach maps
- d) Velocity map

17) The main idea of loop is tie between two seismic lines

- a) Inline & Crossline
- b) Inline & Inline
- c) Crossline & Crossline
- d) Arbitrarily line & Inline

18)is the description of the position of the wavelet's peak amplitude on a relative time scale.



- a) Phase
- b) Polarity
- c) Trough
- d) Reflection Coefficient

2. Explain the different steps to form 3D structural modeling from the available seismic data and wells. (45 degree)

3. Write short notes on the following:- (45 degree)

- a. Synthetic seismograms.
- b. Vertical seismic profile (VSP).
- c. 2D and 3D seismic surveying.



EXAMINERS	DR. MOATAZ BARAKAT
	DR. RAMY AMAD EL-DIN

	ANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF GEOLOGY Petroleum & Mining Geology Program (PMGP)				
	Final Exam For The Fourth Level of PMGP Students				
	Examiners: Prof. I. Salem Prof. B.el-desouky	COURSE TITLE : ORE MINERALOGY		COURSE CODE: PMGE 4101	
	DATE: 22-2-2021	FIRST	Total Assessment: 40 marks		TIME ALLOWED: 30 mins.

True or False

- 1-All ores are opaques and not all opaques are ores.
- 2-Rotatable stage should be centered to polished sections.
- 3-The primary enlargement is due to ocular lenses.
- 4-Illuminary system in ore microscope is substage.
- 5-There are two types of reflectors.
- 6-The basal section of tetragonal and hexagonal systems are anisotropic.
- 7-In ore microscope the analyzer found in illuminating system.
- 8-Color is one of the qualitative optical properties.
- 9-Kalb light line test is to examine the relative hardness.
- 10-Bireflectance is the change in reflectance where as reflection pleochroism is change in color.
- 11-In polished sections, relief means even surface.
- 12-There is an opposite relationship between the free-working distance and power magnification of objective lens.
- 13-The secondary image is due to objective lens.
- 14-The relationship between angular aperture and the power of magnification of objective lens is opposite relationship.
- 15-The ocular lens used in ore photography should be equipped with crosshairs and grid.
- 16-In ore microscopic the polished section is perpendicular to the incident light beam.
- 17-Polishing hardness is one of the quantitative properties.

- 18- In preparation of polished section the polishing process comes before grinding.
- 19- Internal reflections are characteristics of transparent minerals.
- 20- Anisotropic color ore is the color exhibited by an anisotropic on rotating the stage.
- 21- The ore minerals are capable of solid solutions.
- 22- Covellite-chalcocite solid solution is capable at temperature at about 75°C.
- 23- Silver rich gold commonly shows a zonal texture.
- 24- If arsenic is present in excess of 4% but less than 30%, Cu_3As is formed.
- 25- Most native gold contains a large amount of copper in solid solution.
- 26- The unmixing of a solid solution takes place by the diffusion of the solvent atoms through the lattice of the solute substance.
- 27- The emulsion intergrowths occur as lamellar or rod-like.
- 28- The homogenous single phase solid solution, is named according to the major metal.
- 29- Hematite – ilmenite exsolution texture was formed at temperatures above 600°C.
- 30- Sphalerite in chalcopyrite is capable of solid solution at temperatures above 350.
- 31- With slow cooling, fine – cloth or box – like network of ulvospinel arranged along (001) direction of magnetite.
- 32- At low temperatures, hematite and magnetite form a partial solid solution.
- 33- If the concentric lamination is present, they are spherulites.
- 34- If the successive crusts of the different minerals surrounded breccias fragments, comb texture may result.
- 35- Oolitic textures generally indicate deposition in a marine environment.
- 36- Supergene minerals are the alteration products of hypogene minerals.
- 37- Colloidal textures are produced by precipitation from colloidal solutions and gels.
- 38- Pentlandite will dissolve in pyrrhotite to the extent of about 40% at temperatures above 425 to 450°C.
- 39- Chalcocite invading a mixture of pyrite and chalcopyrite generally shows a preference for the pyrite.
- 40- Caries texture is the relation between the grain boundaries of host and metasome mineral.

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF GEOLOGY			
	EXAMINATION for Petroleum and Mining Geology Program (PMGP)			
COURSE TITLE:	Geochemistry Applied		COURSE CODE:	
DATE:	DEC.2020	TOTAL ASSESSMENT MARKS:	TIME ALLOWED: 2 HOURS	

Part (I) (marks)

A-Comment of the following:(15 marks)

- 1- LREE are highly incompatible elements relative to HREE.
- 2- Mg proceeds Fe in olivine during magma crystallization and Ca proceeds Na in plagioclase during magmatic crystallization.
- 3- If KD is less than one then the con. of the element will increase with crystallization
- 4- Behaviour of Na and K during magmatic Crystallization.
- 5- Some trace elements are compatible with crystal structure of major elements.

B- compare between the following pairs :(15 marks)

1. LILE and HFSE.
2. Tektites and Sidrolite.
3. Isochron and Primordial composition.
4. Heavy and Light isotopes.
5. Captured trace elements and camouflage elements.

C- Explain by graphs how to solve the following:(20 marks)

1. Parent age and metamorphic age using Rb/Sr Method of dating.
2. Kaolinite and Montmorillonite depositional composition.
3. Migration of half values of Pb^{206} and Pb^{207} during U lead system isotope measurement.
4. Decay of daughter isotope and growth of parent isotope.
5. Follow up crystallization of a magmatic liquid made of 20% Albite and 70% Anorthite with decreasing temperature.

Part (II) (50 marks)

1-Put \checkmark or \times marks and correct the wrong ones:-(10 marks)

- 1-The positive values of quartz no indicate undersaturated rocks

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- 2- The core are mainly formed from Lithophile elements whereas the mantle are mainly formed from Chalcophile elements such as Mg and Li
- 3- XRF used for determine isotopic ratios in rocks and minerals
- 4- K- Ar dating used for older rocks whereas U- Pb dating used for determine age of metanmorphism

2-Complete the followings: (25 marks)

- 1- S-type granites characterize bySiO₂ andNa₂O+ K₂O with magma type and characterize by some index minerals such as.....
- 2-Geochemical classification of the elements based on,, and classified into,,
- 3-Within plate granites aretype granites, formed in setting and have..... magma type.
- 4-The mantle is mainly formed from elements whereas the crust is mainly formed from elements such as
- 5- Meteorites are classified into,, and similar to,, respectively.
- 6-Uranium - thorium mineralization occurs in rocks as..... contains high amount of,,elements
- 7- Ni and Cr elements occurs in rocks such as, contains high amount ofelements
- 8--Volcanic arc granites have a magma type and originated in tectonic setting
- 9-ICP used for determine Whereas XRF used foranalysesas
- 10-Mineral chemistry carried out using instrument and measure the concentration of elements as



3- Write briefly on the following: (15 marks)

- 1- Discuss the geochemical aspects of crystallization of magmas as reveal by reaction series.
- 2- Geochemical characteristics of different types of granites (A-, I-, S-, M-type) and their tectonic setting
- 3- Discuss the analytical procedures and different techniques used for isotope studies.
- 4- Write on the rule of minor and trace elements in metamorphic rocks and give example for their applications in study of ores
- 5- Discuss Different steps and methods for determine the chemistry of minerals

Examiner: Prof. Mohamed Fouad Ghoneim

Examiner: Prof. Mohamed Metwaly Abu Anbar

Good Luck

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF GEOLOGY			
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	ANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF GEOLOGY Petroleum & Mining Geology Program (PMGP)				
	Final Exam For The Fourth Level of PMGP Students				
	Examiners: Prof. I. Salem Prof. B.el-desouky	COURSE TITLE : ORE MINERALOGY			COURSE CODE: PMGE 4101
DATE: 22-2-2021	FIRST	Total Assessment: 140 marks	TIME ALLOWED: 120 mins.		

PART I

I-Write on the following : (40 marks)

- a- Objective lenses
- b- Colour
- c- Rotatable stage
- d- Grinding and polishing abrasive materials.
- e- Equations of Vicker s microindentation hardness.

II-Answer the following with drawing only: (30 marks)

- a- Components of ore microscope.
- b- Mechanical and thermal zones of deformation.
- c- Shapes and fracture characteristics of microindentation hardness.

PART II

Answer the following questions: (70 marks)

- 1- Colloform textures in supergene minerals.
- 2- Replacement textures
- 3- Chalcopyrite-sphalerite, Bornite-chalcocite and Pentlandite-pyrrhotite exsolution textures.
- 4- Hematite- ilmenite, Ulvospinel-magnetite and Hematite- magnetite exsolution textures.
- 5- Write short notes on:
 - a- Growth zoning
 - b- Oolitic texture



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FINAL EXAMINATION FOR FOURTH LEVEL STUDENTS OF PMGP

COURSE TITLE: Well Logging	COURSE CODE: PMGE 4103	TIME ALLOWED: 2 HOURS
DATE: 10/03/2021	TOTAL ASSESMENT MARKS: 180	TERM: FIRST

1-Give reasons on the followings (45 marks)

- a. Trubo drilling is better than rotary one in hard rock perforation.
- b. Induction logging device can be worked in holes filled with oil base mud.
- c. Micronormal and microinverse curves are used as hydrocarbon indicator.

2-Explain the principles of measurements of the following devices (45 marks)

- a. Spherically focused log (SFL).
- b. Conventional electric resistivity logging tool.
- c. Microlaterolog (MLL).

3-Mark (✓) in front the correct answer and (X) in front the wrong answer: (22.5 Marks)

- 1. The neutron porosity is consider effective porosity ()
- 2. The permeability can be directly obtained from log measurements ()
- 3. The secondary porosity can be directly obtained from sonic tool measurements ()
- 4. The total porosity can be directly obtained from density tool measurements ()
- 5. The shale volume can be obtained from CGR curve ()
- 6. Caliper logs are used for identifying reservoirs ()
- 7. The big separation between neutron and density logs indicating presence of water ()
- 8. The spectral gamma ray log is consider as a porosity log ()
- 9. High count rates at detectors are good indication for high density formation ()
- 10. The Green pattern is characterized by both Azimuth and Dip are Uniform ()
- 11. The type of clay mineral can be identified from neutron tool ()
- 12. The calculation of total porosity from density depend on the matrix density of the formation ()
- 13. Determination of magnitude and direction of formation dip is consider one of Density tool applications ()
- 14. Tri – porosity cross-plots are used to determine the lithology and porosity of the reservoir ()
- 15. The Sonic porosity tool can run in any type of fluid filled borehole ()

4-Choose the correct answer: (22.5 Marks)

- 1.The big separation between neutron and density logs indicating :
 - a. Presence of Gas
 - b. Presence of Oil
 - c. Good Permeability
- 2.The "Density" porosity is :
 - a. Effective porosity
 - b. Total porosity
 - c. Secondary porosity
- 3.The photoelectric absorption (Pe) is consider :
 - a. Porosity indicator
 - b. Lithology indicator
 - c. Hydrocarbon indicator
- 4.The Caliper log is a continuous profile showing variations in :
 - a. Density
 - b. Porosity
 - c. Diameter

5. The count rates at Neutron tool detector increase when hydrogen concentration is :
 - a. High
 - b. Low
 - c. Moderate
6. The presence of steel casing will..... gamma ray count rates :
 - a. Increase
 - b. Reduce
 - c. Affect positively
7. Neutron tool can be run in :
 - a. Cased-hole only
 - b. Open-hole only
 - c. Open and cased holes
8. The Epithermal neutron tool use source :
 - a. Chemical
 - b. Electronic
 - c. Organic
9. pattern is characterized by both Azimuth and Dip magnitude are random :
 - a. Green
 - b. Yellow
 - c. Red
10. The gamma ray log motifs typically exhibit consistent and relatively low gamma ray values in :
 - a. Bell Shape
 - b. Funnel Shape
 - c. Cylinder Shape
11. In Neutron tool, count rates at detector When hydrogen concentration is low :
 - a. Decrease
 - b. Increase
 - c. Not Affected
12. In Sonic tool, the transmitters emit into formation :
 - a. Gamma Ray
 - b. Neutrons
 - c. Sound Waves
13. Red pattern followed by Blue pattern and both patterns have the same Azimuth as Fault in :
 - a. Normal Fault
 - b. Reverse Fault
 - c. Strike – slip Fault
14. The spectral gamma ray tool distinguishes the three component (Potassium, Thorium or Uranium) by the Of their characteristic gamma emission :
 - a. Vertical Resolution
 - b. Wavelengths
 - c. Depth of investigation
15. Dia – Porosity cross-plots are used to determine :
 - a. Minerals Only
 - b. Porosity Only
 - c. Porosity and Lithology

5- A) Mention the applications (Uses) of the Sonic logging tool. (7.5 Marks)


B) Give short notes about the principle of Density logging tool. (7.5 Marks)

6- Given the below data, calculate the following: (30 Marks)

- a. Shale Volume by Using Linear Method.
- b. Total Porosity from Density Log.
- c. Secondary Porosity.
- d. Hydrocarbon Saturation (S_h).

GR_{min} API	GR_{max} API	ρ_{mat} gm/cc	ρ_f gm/cc	Δt_{mat} μ sec/ft	Δt_f μ sec/ft	R_t ohm.m
15	70	2.66	1.1	55.5	189	150
GR_{log} API	ρ_{log} gm/cc	Δt_{log} μ sec/ft	a	m	R_w ohm.m	
20	2.46	65	1	2	0.02	

Good Luck

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF GEOLOGY			
	EXAMINATION FOR SENIORS STUDENTS OF GEOLOGY			
	COURSE TITLE:	PETROPHYSICS		COURSE CODE: PMGE4111
DATE:	15/3/ 2021	SEMESTER:FIRST	TOTAL ASSESSMENT MARKS: 120	TIME ALLOWED: 2 HOURS

Answer the following questions:

1-Discus the following relations: (33 marks)

- a) Capillary pressure- water saturation.
- b) Porosity- permeability.
- c) Water saturation-water formation resistivity (Rw).

2-Write on the following: (33 marks)

- a) Rock wettability.
- b) Reservoir quality index
- c) Factors affecting the physical properties of reservoir rocks

3-Complete the following statements: (24 marks)

- a) Geological classification of permeability classified into
 - 1-.....
 - 2-.....
- b) Diagenesis process reducing porosity are:
 - 1-.....2-.....
 - 3-.....
- c) Applications of formation resistivity factor are
 - 1-.....
 - 2-.....3-.....
- d) Capillary pressure is defined as.....
- e) Electrical resistivity is affected by
 - 1-.....2-.....
 - 3-.....4-.....
- f) Log porosity is practically chosen over core porosity for the following reasons:
 - 1-.....2-.....
 - 3-.....

باقي الأسئلة بالخلف