Geology Department
Faculty of Science
Assiut university

Final Exam of
Environmental Geophysics (353G)

Jan. 2020 *Time: 2 Hours*

Answer the following questions

First Question (30 Marks)

1- Microgravity surveying and its applications
2- Distortion of Magnetic survey
3- **How** is GPR similar/different from seismic reflection in the following ways Source/Receiver(s), Travel time equations, Wave type, Wave velocity, Frequency, Wavelength, Penetration Depth, Causes a Reflection.
4- The electrical anisotropy is of interest to the environmental and engineering geophysicists (**How**)? and **Define** the Darzarrouk parameters .
5- **Creating** a detailed log of field geophysical survey report.
6- **Define** Blind zone of refraction survey with drawing.

Second Question (20 Marks)

A) Compare between (*Answer Only THREE*) (4 marks for each)

a) Raw gravity and Theoretical gravity field
b) Normal Magnetic Field and Total Magnetic anomaly map
c) Dipping and curved reflectors.
d) Electrical profiling and Electrical imaging

B) Complete the missing answer (8 marks)

1. Seismic refraction surveys reveal two main pieces of information ……..and……..
2. Migration intended to deal with…….....and……....
3. Geologic problems conducive to solution by GPR methods may be…… , ……... and……
4. The direct ray and the refracted ray arrive in different order depending on …… from source and the velocity structure

"Best wishes"

Geology Department Faculty of Sciences Assiut University Third level		Final Term Examination Principles of Petrology (324 G) December, 2019 Time: Three Hours

مقرر مبادئ علم الصخور (324ج) لطلاب المستوى الثالث (الإمتحان فى ورقتين)

Part I (Igneous and Metamorphic rocks) (33 Marks)

Answer THREE ONLY from the following questions:

Q1(11 M)

What is the difference between?

i- Metamorphism and diagenesis.
ii- Porphyblastic and poikiloblasts.
iii- Intrusive and extrusive rocks.
iv- Igneous dike and sill.

Q2 (11 M)

a- Discuss the factors affecting viscosity of magma/ lava.
b- Explain the mechanism of formation of porphyritic textured rocks.

Q3 (11 M)

a- Explain the factors affecting regional metamorphism.
b- Write on the various types of pyroclastic fragments.

Q4 (11 M)

a- What are the main characteristics of Aa Lava and Pahoehoe Lava ?
b- Explain the various types of foliations.

Part II (Sedimentary rocks) (17 Marks)

Answer the FOLLOWING QUESTION (إجبارى): (5 Marks)

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

1) Layers of Mg-O/OH in a clay mineral are referred to as brucite layers ( ).
2) Intraformational conglomerates are derived from outside the depositional basin ( ).
3) Heavy minerals typically have densities that exceed those of the common rock-forming minerals quartz and feldspar ( ).

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4) Glacial till that is transported within glacial ice is typically angular in shape ( ).
5) Roundness is a description of how angular the edges of a particle are ( ).
6) Gypsum is the main mineral constituent of the carbonate minerals ( ).
7) Oligomictic conglomerates are composed of clasts include several different rock types ( ).
8) Permeability refers to the volume of void space (available to contain fluid or air) in a sediment or sedimentary rock ( ).
9) Arkoses are mainly composed of quartz grains with matrix less than 15% ( ).
10) The better sorted a sediment is the greater its permeability ( ).

Answer ONLY ONE from the following Questions: (12 Marks)

I- The First Question (12 Marks)

Write on the following:

A) Classification of sandstones (3 Marks)

B) Definition of the following: (4 Marks)

i) Roundness of the grains ii) Sphericity of the grains

iii) Form of the grains iv) Texture of the sediments

C) Evaporite rocks in view of their identification, mineralogical composition and their importances. (5 Marks)

II- The Second Question (12 Marks)

Write on of the following:

A) Classification of conglomerates and Breccias (3 Marks)

B) Compare between the following: (4 Marks)

i) Quartz arenite and quartz wacke

ii) kandite group and smectite group in clay minerals.

C) Define the porosity and permeability in sedimentary rocks and write briefly on the factors controlling them and their importances. (5 Marks)

Good luck

Prof. Dr. Galal H. El-Habak *Prof. Dr. Mahmoud A. Essa*

Assiut University
Faculty of Science
Geology Department

جامعة أسيوط
كلية العلوم
قسم الجيولوجيا

Final Examination

Time: 2 hours	Total marks: 50	Gravity and Magnetic Exploration (G351)	Dece., 2019

A) Answer the following questions: (*Five marks each*)

1. Summarize what you know about GRACE mission and its applications
2. What are the general guides for the qualitative interpretations of magnetic data?
3. What area the similarities and differences between gravity and magnetic methods?

B) Provide short answer for *only Ten* of the following (don't answer more than ten): (*three and half mark each*)

1. The advantages and limitations of using magnetic gradiometer survey
2. Different corrections applied to gravity data
3. Different applications of magnetic method
4. Different methods for local-regional separation in gravity
5. The sources of Earth's magnetic field
6. The different methods for measuring absolute gravity acceleration
7. Different sources of changes in Earth's magnetic field.
8. List four different applications of gravity method
9. The procedure of acquiring magnetic data on land
10. List five different types of remnant magnetization
11. The idea of ambiguity in gravity data interpretation and how it can be resolved.
12. The difference between forward and inverse modeling for magnetic data

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GOOD LUCK

Prof. Dr. Gamal Zidan Abdelaal

Assiut University *Faculty of Science* *Geology Department*		*First Semester Exam.* *2019 - 2020* *Time: 2 hours*

Subject: Sedimentary Environments and Sedimentary Basins (335 G)

Answer the following questions: *(50 Marks)*

1. ***Which of the following is true and which is false, correct the false ones:*** *(10 Marks)*

( ) *Fining upward is a common feature characterizes the ancient fluviatile sediments.*

( ) *The Nubia Sandstone in Egypt was deposited mainly in Aeolian environment.*

( ) *Winds and salinity are the main processes affecting the marine environment.*

( ) *Surface textures are important in sedimentary history interpretation.*

( ) *Coal deposits of Egypt were accumulated in transitional environment.*

( ) *Sedimentary cycle is characterized either by vertical variation in primary sedimentary structures and/or the change in lithology.*

( ) *Fertilizer materials of Egypt were accumulated in marine environment.*

( ) *Ancient sedimentary basins of Egypt are related to Cretaceous age.*

( ) *Eocene limestone in Egypt had accumulated mainly in neritic environment.*

( ) *Rift basins are related to plate divergence.*

2. ***Compare between the following:*** *(5 Marks)*
   - *Delta plain and prodelta sediments*
   - *Fluvial and Eolian sandstones*
   - *Hurricanes and Tsunamis*

3. *Mention **four** of the main sedimentary basins of Africa.* *(4 Marks)*
4. *Write on the thermal way and loading mechanisms required for the formation of sedimentary basins illustrating your answer with drawings.* *(6 Marks)*

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5. *Answer only <u>ONE</u> question of the followings:* *(8 Marks)*
   - *A. Write short notes on the main criteria required for the recognition of ancient sedimentary environments.*
   - *B. Write short notes on **four** of the following illustrating your answer with drawings:*
     - *Alluvial fans and their controlling factors*
     - *Herringbone cross - bedding*
     - *Autocycles and their controlling factors*
     - *Abu El Gharadiq basin*
     - *Suspended sediments*

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6. *Industrial materials were laid down in Egypt under variable environmental conditions, illustrate the environment of the following:* *(3 Marks)*
   - *Dolomite*
   - *Gypsum*
   - *Placer sediments*

7. *Different **descriptive** classifications of sedimentary basins were applied, write short notes on these.* *(8 Marks)*
8. *Many classifications of sedimentary environments are adopted worldwide, write in brief on **three** of the main types and give examples of modern and ancient analogues from Egypt.* *(6 Marks)*

Ezzat A. Ahmed *Good Luck*

Assiut University
Faculty of Science
Geology Department

Credit hour system - First semester - Final Examination
Industrial Chemistry Program
Mineral prospection and industrial minerals and rocks (Chem 305)
Third Level 2019/2020 Allowed time 2 hour

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Answer FOUR questions only of the following (50M)

Q1 (12.5 M)

i- Mention the factors which are considered in selection of mineral fillers?

ii- Write briefly on the application and importance of those minerals: barite, perlite, halite, fluorite and talc?

Q2 (12.5 M)

i- Discuss the importance of magnetic methods as an exploration technique?

ii- Explain the environmental uses of industrial minerals ?

Q3 (12.5 M)

i- Explain the applications of industrial minerals used in paint and ceramics industry?

ii- Write briefly on the application of gravity techniques used in exploration of ores?

Q4 (12.5 M)

i- Limestone has several industrial uses. Comment?

ii- Mention the uses of industrial minerals in plastics and polymers industry?

Q5 (12.5 M)

iii- Mention some minerals used in the construction and chemicals?

iii- Explain the applications of industrial minerals used in adhesives and sealants industry?

أ.د. جلال الحباك تمت الاسئلة وبالتوفيق

جامعة أسيوط–كلية العلوم
امتحان الفصل الدراسي الأول
قسم الجيولوجيا
ديسمبر ٢٠١٩

G 327: Sedimentology & Depositional Systems

Part 1: Sedimentology (25 Marks)

Answer five questions only:

1. Describe briefly the texture and composition of the following rocks:
   a- Calcareous oligomectic conglomerate
   b- Quartz arenite

(5 Marks)

2. What is the difference between heavy minerals and light minerals? Why we study the heavy minerals?

(5 Marks)

3. a- What is the difference between mudrocks and shale?
   b-Mention only the names of the clay mineral groups

(5 Marks)

4. a- Define the term diagenesis?
   b- What is the main diagenetic processes during compaction?

(5 Marks)

5. Mention the type of cements in the sandstone rocks.

(5 marks)

6. a-What is the difference between the limestone and dolomite?
   b-Mention briefly The limestone components.

(5 Marks)

أ.د. محمد احمد سليمان

Part Two: Sedimentary Environments (25 marks)

Answer the following questions

Question No. (1): Choose the correct answer (5 marks)

1. Which of the following are all types of coral reef.....?

A. Fringing, barrier, atoll. B. Atoll, cay, fringing.

C. Atoll, barrier, cay. D. Fringing, barrier, cay.

2. Braided streams with, large amounts of very coarse bed-load sediments, deposit what bed-form.....?

A. Point bars. B. Mid-channel bars. C. Levees.

3. Natural levees result when.....

A. Streams flood their banks and deposit sediment directly on top of the banks.

B. Streams erode downward in their channel, leaving their banks higher relative to the surface of the stream.

C. Hard, erosion-resistant rocks become part of a stream's banks. Smaller streams flow parallel to a main stream and deposit material on the stream bank.

4. The primary difference between a delta and an alluvial fan is that.....

A. Alluvial fans are erosional features, whereas deltas are depositional features.

B. Alluvial fans result from deposition into inland lakes, while deltas result from deposition into the ocean.

C. Alluvial fans form at the source of a stream and deltas form at the mouth of a stream.

D. Alluvial fans are formed on low-land plains, while deltas are formed in a standing body of water.

5. Type of sand dunes formed in sandy dessert, when continuously wind changes its direction.....

A. Alluvial fans. B. Mesas. C. Star dunes. D. None of above.

****

Question No. (2): True or False (5 marks)

A. Small-scale, wave-like structures on bedding planes produced by running water are called flute casts.

B. Deltas are the seaward mouths of rivers drowned by the sea.

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C. Trace fossils are good environmental indicators because they are in situ features and they are not transported.

D. A meandering river system has a unidirectional current flow; marine tidal channels have bidirectional but aeolian environment has polydirectional current flow.

E. The over-all shape of a sedimentary facies is a function of pre-depositional topography, the geomorphology of the depositional environment and its post-depositional history.

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Question No. (3): Fill in the given spaces with appropriate words (5 marks)

A. Unlike lithology and fossils,..... are undoubtedly generated in place and can never have been brought in from outside.

B. ..... are accumulations of sediment formed by the reduction in velocity of stream upon reaching the ocean. Sometimes, cross-bedded sandstones, sometimes plane-bedded sandstones.

C. ..... marked by the interaction of fluvial and near-shore marine processes. Deltas, beaches, tidal flats, bars and lagoons are examples.

D. Two major types of delta may be differentiated,.....dominated deltas, and those dominated by .....process.

E. .....is a mass of sedimentary rock which can be defined and distinguished from others by its geometry, lithology, sedimentary structures, paleocurrent pattern, and fossils.

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Question No. (4): Explain briefly the following topics with drawing (5 marks):

A. The alluvium of braided rivers (2 marks).

B. Sub-environments and processes of sand dunes (1 mark).

C. The basic types of delta (2marks).

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Question No. (5): Explain briefly the following topics with drawing (5 marks):

A. Sub-environments and processes of Alluvial fans (1 mark).

B. The geological significance of an Ox-bow lakes formation (2 marks).

C. The three morphological elements of reef (the fore-reef, the reef flat, and the back-reef) (2 marks).

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Best wishes *Dr. Abdalla El Ayyat*

جامعة أسيوط

كلية العلـــوم-قسم الجيولوجيا

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

يونيو ٢٠١٩ | الدرجة الكلية (٥٠ درجة) | الزمن : ٣ ساعات

PART I: ROCK MECHANICS *(18 marks)*

1- What are the differences between the following items? **(12 MARKS)**
(Answer Four only)

a) Confining (lithostatic, hydrostatic) pressure and Directed pressure.
b) Composition of forces and Resolution of forces.
c) Plastic strain and Elastic strain.
d) Homogeneous strain and Non Homogeneous strain.
e) Body forces and Surface forces.

2-Discuss how the mechanical behavior of rocks is controlled by confining pressure and temperature . **(6 MARKS)**

PART II: STRUCTURAL GEOLOGY (32 marks)

ANSWER THE FOLLOWING TWO QUESTIONS:

Try to Illustrate your answers with suitable drawings when possible

I. Choose the correct answer for FIVE OF the following statements, and then rewrite in your answer paper **(5 MARKS)**

1. ..... is a fault rock consisting of loose or loosely bound angular rock fragments often in a gouge matrix. *(1 mark)*
Mylonite - Fault breccias - Pseudotachylite

2. On a listric fault the hanging-wall block rotates around an axis that is .....
a- parallel to the fault surface
b- perpendicular to the fault surface
c- oblique to the fault surface *(1 mark)*

3. .....is a term used to indicate the direction of movement and rotation that occurred during deformation *(1 mark)*
Vergence - Simple shear - Rake - Enveloping surface

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4- In similar folds ..... *(1 mark)*

a- maintain constant layer thickness across the folded surface.
b-the layer thickness parallel to the axial surface remains constant.
c- inter-limb angles are equal.

5- The angle between fold limbs in the profile plane is called the ..... *(1 mark)*

interlimb angle - *true dip angle* – *vergence angle*

6- In faulting, the horizontal component of dip separation is called..... *(1 mark)*

Throw - *Heave* - *dip slip*

II. Salt diapirs are considered one of the main structural styles of high geologic importance; explain their mode of formation , the associated geologic structures and their economic importance. *(7 marks)*

ANSWER ONLY FOUR OF THE FOLLOWING QUESTIONS:

III. Define and illustrate by drawings: *(5 marks)*

Overturned folds – Monoclines - Listric faults -

Strike Oblique slip normal fault - Pull-apart basin

IV- Write short notes on field criteria of faults . *(5 marks)*

V- Write on the structures associated with strike–slip faults . *(5 marks)*

VI- Write on the structural make up of the Gulf of Suez and the main characteristics of different basins of the Gulf. *(5 marks)*

VII- Explain how folds may develop as an indirect result of shearing stress. *(5 marks)*

GOOD LUCK

Prof. Dr. Moustafa M. Youssef *Dr. Hassan Sayed Abbas*

Assiut University
Faculty of Science
Geology Department

Allowed time: 2 hours
January, 2020
Metamorphic Petrology (336G)

Answer the Following Questions (Multiple Choice) (Degree: 50)

1-The blueschist facies is a metamorphic product of.....
High temperature and pressure
Low temperature and pressure
High temperature but relatively low pressure
High pressure but relatively low temperature

2-The characteristic texture of Gneiss is .....
Granoplastic texture Schistose texture
Corona texture Gneissic texture

3- Thermal (contact) metamorphism occurs.....
In areas surrounding igneous rocks In areas around sediments
In areas near Oceans In areas underground

4- The kind of metamorphism which occurs in the direction of mineralogical reconstitution is .....
Dynamic metamorphism Thermal metamorphism
Thermodynamic metamorphism Barometric metamorphism

5-The parent rock of slate is .....
Shale Limestone Basalt Gabbro

6- The metamorphic process involving formation of new minerals by chemical replacement of preexisting minerals is .....
Metagenesis Holomorphism
Metasomatism Polymorphism

7- The dagnostic texture of marble is called .....
Gneissic texture Schistose texture
Granoplastic texture Corona texture

8- In which metamorphism there is almost no or little new minerals is formed?
Dynamic metamorphism Thermodynamic metamorphism
Thermal metamorphism Barometric metamorphism

9- The most prevailing kind of metamorphism is .....
Thermal metamorphism Dynamic metamorphism
Thermodynamic metamorphism Barometric metamorphism

10- Dynamothermal or thermodynamic metamorphism involves action of .....
Temperature pressure fluids Temperature, pressure and fluids

11- When the pressure acting on rock is of hydrostatic type, then it is called .....
Pressure metamorphism Load metamorphism
Secondary metamorphism Clastic metamorphism

12- Which nonfoliated rock forms only in a zone of contact metamorphism ?
Conglomerate Hornfels Pegmatite Quartzite

13- Wavy bands of light and dark minerals visible in gneiss bedrock probably formed from the .....
Cementing together of individual mineral grains
Cooling and crystallization of magma
Heat and pressure during metamorphism
Evaporation of an ancient Oceans

14- How do the metamorphic rocks Schist and Quartzite differ?
Quartzite contains the mineral quartz and schist does not.
Quartzite forms from regional metamorphism
Schist is organically formed and quartizite is not.
Schist is foliated and quartizite is not.

15- The relation between formation of Gneiss and melting of rocks is that, Gneiss represent the last stage in the metamorphism of rocks ....
Before melting After melting During Melting None of them

16- Type of metamorphism where part of country rock may get entrapped within magmatic body .....
Contact metamorphism Plutonic metamorphism
Pyrometamorphism Dyke metamorphism

17- Which of the following is not a metamorphic rock ?
Obsidian Gneiss Quartizite Marble

18- Metamorphic facies are groups of metamorphic rocks characterized by ?
High temperature and pressure only
Particular mineral assemblages formed under the same broad P-T conditions
The same isograd
All of the above

19- From which of the following rock groups can metamorphic rocks form ?
Igneous Sedimentary Metamorphic All of the above

20- Which metamorphic rock is foliated but does not generally break along the Foliation planes ?
Gneiss Marble Quartzite Schist

جامعة أسيوط
كلية العلـــوم-قسم الجيولوجيا

امتحان طلاب المستوى الثالث (كيمياء وجيولوجيا)
مقرر (٣٤٥ ج) مبادئ الجيولوجيا التركيبية

يناير ٢٠٢٠م

الزمن : ٢ ساعة

PRINCIPALS OF STRUCTURAL GEOLOGY

(50 marks)

Try to illustrate your answers with suitable drawings when possible

ANSWER THE FOLLOWING QUESTIONS:

I- Choose the correct answer for the following statements and Then rewrite in your answer paper *(10 marks)*

1. Elastic limit is the point
   a. up to which stress is proportional to strain
   b. At which elongation takes place without application of additional load
   c. Up to which if the load is removed, original volume and shapes are regained
   d. None of the mentioned
2. The line of maximum curvature in a fold is known as:
   a. Crest.
   b. Axis.
   c. Hinge.
   d. Trough.
3. Drag folds:
   a. Occur within the competent beds.
   b. Within the competent beds.
   c. Within the incompetent beds are overlain by competent beds.
   d. When vertical stresses act on horizontal beds.
4. An unconformity is
   a. a sedimentary unit.
   b. a period of deposition.
   c. a buried erosional surface.
   d. a type of fold.
   e. a type of fault.
5. Compressive Strain is
   a. Increase in length / original length
   b. Decrease in length / original length
   c. Change in volume / original volume
   d. All of the above.

II- Write briefly on THREE ONLY *(12 mark)*

6. Non-Tectonic Structures.
7. The difference between "stress" and "strain"?
8. Indirect Folding
9. Relation between stress and pore space (porosity).

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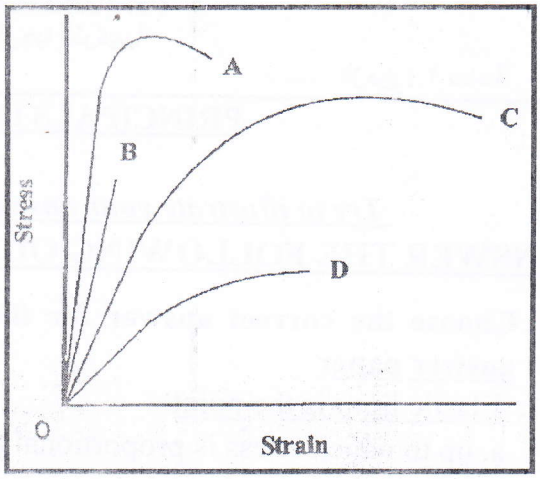
III- Look at The graph below which showing stress-strain diagrams of four materials **(A, B.C&D) and answer the questions**: *(8 mark)*



10. The stress-strain curve of the most elastic material is A / B / C / D. **Why?**

11. The stress-strain curve of the most brittle material is A / B / C / D. **Why?**

12. The stress-strain curve of the most ductile material is A / B / C / D **Why?**

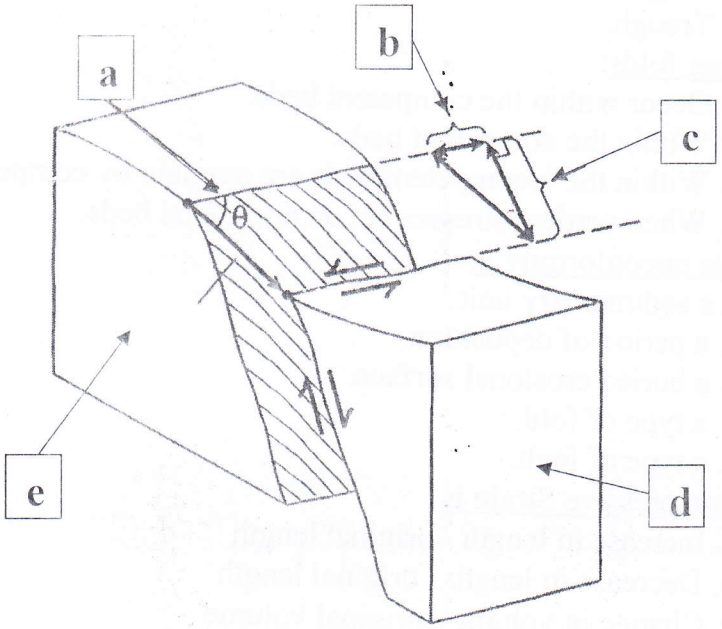
13. Which rock material breaks before the others (**C** or **D**), **why**?

IV- 14. Define and illustrate by drawings FIVE ONLY: *(10 marks)*

Cross bedding - Hysteresis - Overturned anticline - Columnar joints - Parasitic folds – structural terrace.

V- 15. What is the type of the fault draw below? Show the different fault-slip components in the blank rectangles *(10 marks)*

a) ..... :
b) .....
c) .....
d) .....
e) .....



GOOD LUCK

Prof.Dr. Ahmed R. El Younsy

Jan. 20, 2020

Time: 2h

Univ. of Assiut

Fac. Of Science

Dept. of Geology

Igneous Petrology (33 G)

3rd year

Answer FOUR ONLY of the following, illustrating your answer with drawings:

1. Define the forms of the following igneous rocks:

   (i) Ring complexes

   (ii) Lens-shaped intrusions (12.5 Mark)

   (iii)Subjacent plutons

2. Write on the crystallization of magmas. (12.5 Mark)

3. Discuss the processes of magmatic assimilation. (12.5 Mark)

4. Compare between the following:

   (i) Volcanic breccias and agglomerates

   (ii) Ignimbrite and tephra (12.5 Mark)

   (iii) Crystal and lithic tuffs

5. Discuss briefly **ONE ONLY** of the following: (12.5 Mark)

   (i) Geographic classification of basaltic rock varieties

   (ii) Streckeisen classification of granitic rocks

DR.M.E. Habib

DR.O.M.EL. Nadi

Geology Department
Faculty of Sciences
Assiut University

First Term Exam
Diagenesis & Marine Geology (323 G)
3rd Level of Geology
Jan., 2020
Time: Two Hours

Part One: Diagenesis (25 Marks)

Answer the following questions:

The first question: True or False in the following statements with correct the false ones (9 marks; each point is 1.5 marks)

1. When a mineral dissolves leaving pore space in rock, can cause secondary porosity.
2. Silica cements precipitate from acid solutions at pH < 7.
3. Compaction requires sediment deposits to expel water that is filling pore space which causes the deposit to thin.
4. A "new" mineral that grows in a pore space is "Dissolution.
5. Calcite occurs as pore filling or as euhedral overgrowth in cementation.
6. Minerals with the same composition but different crystal forms called Polymorphs.

The second question: Discuss in brief only *Four* of the followings (16 marks; each point is 4 marks)

1- The three stage process of diagenesis.
2- What is the basic difference between metamorphism and diagenesis?
3- Macroscopic Diagenetic features.
4- Changes of Clay minerals.
5- Feldspar authigenesis in sandstone diagenesis.
6- Different major Regimes of carbonate diagenesis.

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With my best wishes *Dr. Abdelhamid M. Salman*

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Part Two: Marine Geology (25 marks)

Answer the following questions

1. Discuss in detail the different types of plate boundaries (5 marks):

2. Write short notes on the following items (5 marks):

a. Carbonate compensation depth. **b.** Turbidity currents.
c. Coral reef development
d. Continental shelf. **e.** Abyssal plains.

3. Choose the correct answer (5 marks)

I. Pelagic sediments consist of..... (1 mark):

a. Reddish-brown clays derived from the continents.
b. Foraminiferal oozes. **c.** Silica oozes.
d. All of these. **e.** None of the above.

II. Turbidity current is a type of .....(1 mark):

a. Deep current. **b.** Steep current.
c. Long current. **d.** Short current.
e. None of the above.

III. Large fan-shaped deposits of fine-grained sediments that accumulate on the continental rise are called..... ..... (1 mark):

a. Submarine fans. **b.** Atolls. **c.** Alluvial fans.
d. Spits. **e.** Trenches.

IV. Most of the rock mass that supplies biogenous sediment is..... .....(1 mark):

a. That which makes up the continents. **b.** That derived from rocks.
c. The insoluble remains of organisms.
d. Both (a) and (c). e. None of the above.

V. Seamounts are in..... (1 mark)

a. Shallow waters with mountainous, rugged terrain.
b. Shallow waters with a flat, calm terrain.
c. Deep waters with mountainous rugged terrain.
d. Deep waters with a flat, calm terrain.

4. True OR False (5 marks):

a. In the 9th century AD, Arabs invent compass.

b. The hypsographic curve shows what percentage of Earth's surface rises above present-day sea level to a given height, or sinks below it to a given depth.

c. The Earth's crust is broken into about 12 rigid plates which slide over the mantle.

d. The depth below which calcareous skeletons dissolve as fast as they accumulate is called the Calcium Carbonate Compensation Depth (CCD).

e. Siliceous sediments are found in zones of high productivity and high sedimentation rates but only below the CCD where less carbonate dilution occurs and specifically at high latitudes where the water is colder; in such reasons, diatom productivity is typically high.

5. Fill in the following spaces with appropriate terms (5 marks):

a. ..... is the study of the geology of the ocean floor including plate tectonics and paleoceanography.

b. ..... ends at a sudden drop-off called the shelf break. Beyond the shelf break, the slope of the ocean floor becomes much steeper, typically a 4° slope, or 70 ms per km.

c. Along the center of the mid-ocean ridge is the ....., a deep V-shaped notch, where a new oceanic crust is constantly being extruded from Earth's mantle.

d. According to the Theory of Plate Tectonics, new oceanic crust is formed at .....boundaries, and recycled back to the mantle at .....boundaries.

e. During the process of coral reef formation, the first step is called .....

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Good Luck **Dr. Abdalla El Ayyat**

بسم الله الرحمن الرحيم

Assiut University — جامعة أسيوط

Faculty of Science — كلية العلوم

Geology Department — قسم الجيولوجيا

Examination of First Semester 2019-2020, Course No. 319
Chronstratigraphy and Chemostratigraphy
امتحان مقرر319 جيولوجيا (مقرر خاص)
طباقية زمنية وكيميائية

January 2020 — **Time: Two hours**

PART 1: Chronostratigraphy (25 marks)
الجزء الأول : طباقية زمنية (25 درجة)

Answer TWO questions only of the following:

QUESTION 1 (A-C):

1- A- Define the reasons and consequences of the climatic changes which affected the Earth during the end of the Cretaceous Period and led to the global extinction of the Dinosaurs.

1-أ - أذكر أسباب وتداعيات الأحداث المناخية التى شهدها سطح الكرة الأرضية فى نهاية العصر الطباشيرى وأدت إلى الإنقراض الجماعي للديناصورات (6,5 درجة)

1- B: What are the sources of uncertainty of radiometric dating ? (4 Marks).

1- ب : ماهى الصعوبات التى تواجه إستخدام العناصر المشعة فى تأريخ الصخور (4 درجات)

1-C : Correlate between the Chronostratigraphic units and Geochronologic units (4 Marks.)

1-ج :قارن بين الوحدات الطبقية الزمنية والوحدات الزمنية الجيولوجية (4 درجات)

QUESTION 2:

2: Define the GSSP concept and the prerequisites to be fulfilled by a Chronostratigraphic Type-Section (12.5 Marks).

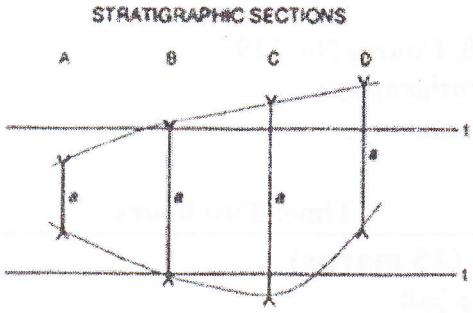
عرف مضمون القطاع الطباقى النموذجى الدولى ، والشروط اللازم توفرها فى إختيار هذا القطاع لتعيين الحد الفاصل بين الوحدات الزمنية.

أنظر باقى الأسئلة فى الصفحة التالية

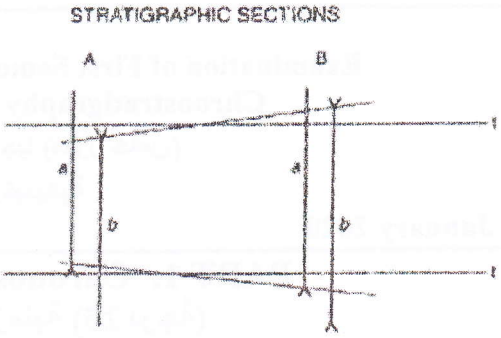
QUESTION 3 (A-B):

3-A: Define the kind of the biostratigraphic unit in the following diagrams a,b,c and d (6 Marks)

3- أ: عرف نوع النطاق البيوستراتجرافى في الأشكال الآتية:

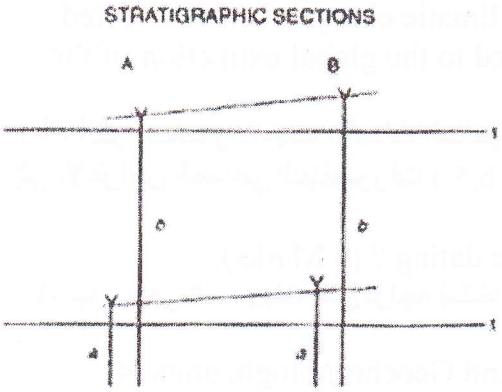


a

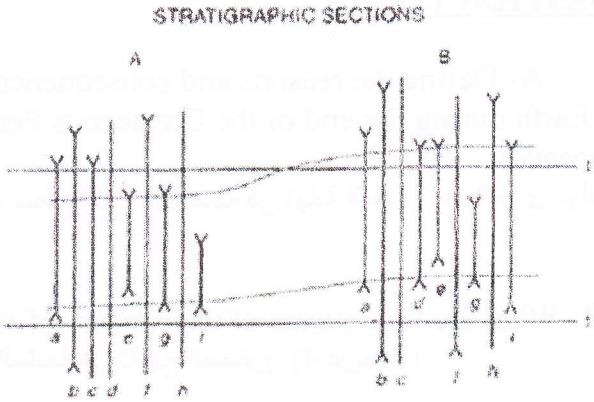


b

t = time surface



c



d

3-B : Suppose that the geologic time scale is only one year made up of 12 months starting from first January to end of December. Try to arrange successively the characteristic bio-events which occurred on the Earth during this time interval.
(6.5 Marks)

3-ب – إفترض أن التاريخ الجيولوجى للأرض هو عام واحد فقط مدته 12 شهرا يبدأ من يناير وينتهى فى أخر ديسمبر. حاول أن ترتب زمنيا بالتوالى الأحداث البيولوجية التى جرت على وجه الأرض خلال هذه الفترة الزمنية (6.5 درجة)

Good luck **Prof. Dr. Khaled Ouda**

Assiut University
Faculty of Science
Geology Department

جامعة أسيوط
كلية العلوم
قسم الجيولوجيا

First Semester, Third Level Final Examination

Time: 2 hours	Total marks: 50	Earthquake Seismology and Seismic Exploration (G350)	January, 2020

PART ONE: Seismic Exploration (25 marks)

QUESTION 1: Put ONLY True or False. **(10 marks)**

1) Elasticity is the property of resisting change in volume or shape and of returning to its original undeformed condition when the external forces are removed.
2) Volume stress is the resulting change in shape of the forced body
3) Phase is an angular quantity that is measured in volts amplitudes
4) When P-wave ray is obliquely incident on the solid-solid interface, two reflected P and S–waves and two transmitted P- and S-waves are generated.
5) When P-wave ray is obliquely incident on the liquid-solid interface, only reflected P-wave and two P and S – waves transmitted are generated.
6) When S-wave ray is obliquely incident on solid-liquid interface of acoustic impedance contrast, two refracted P- and S–waves and only reflected P-wave are generated.
7) Geophones detect the resulting motion of the earth and convert this motion to an electrical signal.
8) Detectors are laid out a line that does not pass through the shot point in longitudinal profile.
9) Distance between the shot point and the last geophone is called offset distance.
10) The detected depth in most cases equals 3 to 5 times the spread lengths.
11) Dip move-out ΔTd is defined as the average travel times of rays reflected from the dipping interface to receivers at equal and opposite offsets.
12) Beyond the critical angle, there is no transmitted ray and therefore a very high reflected ray will be recorded.
13) The waves refracted back into the upper layer are called head waves or first-break reflections.
14) Primary reflections are defined as rays that return to the surface after reflection at a single interface.
15) At abrupt discontinuities in interfaces or structures whose radius of curvature is much longer than the wavelength of incident waves, the laws of reflection and refraction no longer apply.
16) Radial scattering of incident seismic energy is known as diffraction.
17) The intrinsic velocity is given by the rate of advance of a distinct phase break.
18) In anisotropic medium, the ray paths are semi-curved lines and non-symmetrical around the central vertical axis, and vice versa in the isotropic medium.
19) In anisotropic medium, vertical velocity gradient increases as the curvature decrease.
20) First-break refractions can give us important information about the shallow velocities on land seismic data.

QUESTION 2: Filling in the blankets **(15 marks)**

1) According to the acting direction, stress can be ..... stress, ... stress, or ..... stress.
2) Wave number is the reciprocal of .....
3) When P-wave ray is obliquely incident on the solid-liquid interface, two .....waves and only ..... are generated.
4) When P-wave ray is obliquely incident on the liquid-liquid interface, ...wave and .....waves are generated.
5) When S-wave ray is obliquely incident on solid-solid interface of acoustic impedance contrast; two .....waves and two .....waves are generated.
6) When S-wave ray is obliquely incident on interfaces of liquid-solid and liquid-liquid, there are .....waves generated.
7) .....where the shot and detectors are laid along the same profile it is also called in line profiling.
8) ..... when spread of detectors is laid out along the arc of circle and shot point lies in its center.
9) The shooting arrangement that ensures continuity of studying of seismic boundaries is referred to ..... and profiles are called .....
10) Distance between the shot point and the first geophone is called .....
11) The graph of travel time of reflected rays plotted against offset distance is a ..... whose axis of symmetry is the ..... axis.
12) As the angle of incidence increases, the angle of refraction increases to ..... where the refracted ray does not emerge at the second layer but lie along the interface then the angle of incidence is called .....
13) ..... wave travels along the interface between layers and is refracted back into the upper layer at the critical angle.
14) ..... are rays return to the surface after reflection at more than one interface.
15) The ..... can be determined by the envelope of the pulse, and measuring the distance that the envelop travels in unit time.
16) ..... or ..... is the interval velocity across a very thin slice of rocks,
17) ..... is the interval velocity across a geologic section when the top of the interval is the datum to which seismic measurement are referred.
18) In anisotropic medium, if the vertical velocity gradient is ..... the ray path is concave and reaches maximum velocity at the .....
19) Phase is an angular quantity that is measured in .....
20) To find phase velocity, we should decompe the pulse into its frequency component by ..... and measure the speed of each component.

PART TWO: Earthquake Seismology (25 marks)

QUESTION 1: Put True or False and CORRECT the false sentences. **(10 marks)**

1. The origins of Love wave is Rayleigh wave and S-wave.
2. Presence of total internal reflection caused by incidence with smallest angle or critical angle.
3. A P-wave reflected at the outer surface of the crust as P-wave is denoted by PPP
4. Wave frequency is the product of shear wave velocity of a layer divided by four times the thickness of this layer.
5. Sampling frequency is the reciprocal of the sampling time interval
6. The damage occurs when the natural frequency of the layer match the natural frequency of any engineering structure embedded on it.
7. Fourier analyses consist of real part and image part that are divided by the Nyquist frequency.
8. Ray tracing theory depends basically on Snell's law for flat layers.
9. Focal mechanism is the creation of a model of the initial rupture motion to determine the sense of slip of that earthquake or is a graphical summary of the strike, dip, and slip directions.
10. First S-wave motions are either upward or away from the source, or arrive downward or toward the source.
11. Upward polarity of P-waves ground motion indicates an expansion in the source region, whereas downward polarity of P-waves motion indicates a contraction in the source region.
12. Resonance effects are caused by a continuity in the medium properties, which leads to trapped waves with multiple reflections within the layer.
13. The auxiliary plane in focal mechanism is used to describe the direction of slip in the earthquake (this line must lay on the fault plane).
14. Seismic transparency of seismic station base means that solid cemented base of the seismic station have significant impedance change with the underlying soil or hard bedrock
15. The orthogonal motion components can be measured as displacement, velocity, or acceleration. Velocity is the time derivative of acceleration. Acceleration is the time derivative of displacement.
16. Liquefaction is a process resulting in a soil's loss of shear strength, due to a transient excess of pore water pressure.
17. Amplification is an increase in amplitude and change in frequency content of the seismic waves with distance, because of geometric spreading, energy absorption, and scattering.
18. Seismic beach ball is the moment generated by the forces generated on an earthquake fault during slip.
19. Amplification is the rate at which earthquake ground motion decreases with distance.
20. Sand boils or mud volcanoes are (i.e., sand, silt) carried to the surface by water, due to resonance effects.
21. Accelerogram is an instrument for measuring acceleration as a function of time.
22. Nakamura's technique is based on the analysis of the spectral properties of the seismic wavefield recorded by a single one-component seismograph
23. The origin of Rayleigh waves is Shear waves.
24. A wave starting as P, transmitted into the core, and again emerging as P, is denoted by PcP
25. The shape of H/V spectral ratios is controlled by the presence of surface waves in the wave-field, with a minor contribution of surface waves.

QUESTION 2: Answer all the following:

1. Derive impedance change between two horizontal layers. (15 marks)
2. Derive the equations for earthquake epicenter determination, and prove why it is a must to use 3 stations. (9 marks) (6 marks)

GOOD LUCK

End of questions

Prof. Dr. Assem El-Haddad

Dr. Mostafa Thabet

جامعة أسيوط
كلية العلوم - قسم الجيولوجيا

بسم الله الرحمن الرحيم
امتحان المستوى الثالث بكلية العلوم شعبة الجيولوجيا

المقرر: حفريات دقيقة وجيولوجيا تاريخية (315ج) (Micropaleontology, Historical Geology)

2019م الدرجة: 50 درجة الزمن: ثلاث ساعات

ملحوظة: الرجاء توضيح الأجابات بالرسم كلما امكن ذلك

I- Micropaleontology

السؤال الأول: (7.5 درجات)

1- **Compare between only two of the following: (5 Marks)**
   a) The Freshwater and marine Ostracoda. (2.5 Marks)
   b) The Radiolaria and benthic foraminifera. (2.5 Marks)
   c) The Coccoliths and diatoms. (2.5 Marks)

2- Summarize the different environments of foraminifera. (2.5 Marks)

السؤال الثانى: (7.5 درجات)

Write an essay on only three of the following:
   a) The planktonic foraminifera. (2.5 Marks)
   b) The conodonts. (2.5 Marks)
   c) The alternation of generations in foraminifera (dimorphism) (2.5 Marks)
   d) The effect of light and alkalinity on the distribution of foraminifera. (2.5 Marks)

السؤال الثالث: (5 درجات)

Mark the correct and the wrong statements, and correct the wrong: (5 marks; 1 mark each)

A- Treatment of clay samples using sodium hexametaphosphate [(NaPO3)6] provides more palynologically-productive residue than the acid treatment.

B- Potonié's turmal classification of spores and pollen grains is regarded as an artificial (i.e. non-biological) classification.

C- For classifying fossil dinoflagellates, tabulation of the cyst is a very important criterion.

D- Chitinozoan have a particular value to Mesozoic biostratigraphy.

E- For carbonaceous-rich samples, oxidation is an essential process to obtain clear palynomorphs.

السؤال الرابع: (5 درجات)

Choose the correct answer: (5 marks; 1 mark each)

A- D- For the standard palynological extraction technique, which of the following is considered as an optional step:
1- carbonates removal 2- silicates remova 3- oxidation 4- removal of Calcium Fluoride 5- all of them

B- The outer wall layer "Exine" of pollen grains consists of:
1- Intine 2- Ectexine 3- Endexine 4- all of them

C- In prasinophytes the excysment opening is referred to as:
1- Operculum 2- Cyclopyle 3- Archeopyle 4- all of them

D- Fossil and living dinoflagellates are now classified according to:
1- International Code of Botanical Nomenclature (ICBN) as algae
2- International Code of Zoological Nomenclature (ICZN) as protozoans
3- both (ICBN) and (ICZN) 4- none of them

E- Which of the following has quadrifla:
1- Acritarchs 2- Dinoflagellate cysts 3- Prasinophytes 4- Chitinozoa 5- none of them

السؤال اخامس: (5 درجات)

Write briefly on Only TWO of the following: (5 marks; 2.5 marks each)

A- Standard palynological processing technique and safety precautions in lab.
B- Differentiate between Whittaker's 1969 biological classification and Potonié's 1956-60 classification of fossil palynoflora.
C- Definition, taxonomy, morphology, and ecology of prasinophytes and chitinozoa.

II- Historical Geology

السؤال الأول: (15 درجة)

Choose the correct answer:

1- The largest supercontinent during the Permian period was known as .....
a) Pangaea b) Laurentia c) Gondwanaland d) Rodinia

2- Which of the following terms of things found in rocks is NOT part of the Precambrian rock record?
a) Stromatolites b) Shelled organisms c) Algae d) Bacteria

3- The smallest formal unit of the Chronostratigraphy is .....
a) Peroid b) Stage c) Series d) Era

4- The first form of life on the Earth.....
a) Cyanobacteria b) Angiosperms c) Gymnosperms d) Spones

5- The principle of uniformitarianism is often summarizing .....
a) supernatural forces at work
b) conditions exiting today cannot from rocks as in the past
c) the present is the key to the past
d) rocks cannot be made in the laboratory

6- The center of the earth is known as the.....
a) Crust b) Core c) Atmosphere d) Hydrosphere

7- Greenhouse effect will lead to
a) an increase in Oxygen Production b) greater rainfall
c) decrease in atmospheric pressure d) an increase in the temperature

8- The idea that older rocks are on the bottom of an undisturbed sequence is called.....
a) superposition b) lateral continuity
c) cross-cutting relationships d) faunal succession

9- What is the correct order of the epochs of the Paleogene Period from earliest to latest?
a) Cretaceous, Jurassic, Triassic b) Paleocene, Eocene, Oligocene
c) Oligocene, Miocene, Pliocene d) Eocene, Cretaceous, Paleocene

10- Eras of the Standard Geologic Time Scale are subdivided into:
a) Eons b) Epochs c) Ages d) None of these

11- Which subdivision of geologic time is the longest?
a) Paleozoic b) Mesozoic
c) Tertiary d) Quaternary

12- Which of the following is not a type of unconformity?
a) Nonconformity b) Disconformity
c) Uniformity d) Angular unconformity

13- Tillite is formed from
a) Lake sediments b) River sediments
c) Marine sediments d) Glacial deposits

14- The first form of vertebrate life on the Earth
a) Jawless Fish b) Armored Fish
c) Cartilage Fish d) Bony Fish

15- The relative age of something is .....
a) its age in relation to Earth b) its age since it was formed
c) its age in comparison to other things d) its age since it died

Write on the following: السؤال الثاني: (5 درجات)

1- Discuss the following sentences: (2 Marks)
a) Proterozoic climate b) The closure of Iapetus Ocean
2- Tabulate the rock-bulding fossils throughout the Paleozoic Era. (2 Marks)
3- Write the derivation of only two of the following: (1Mark)
a) Cambrian Period b) Carboniferous Period c) Cryptozoic Era

تمت الأسئلة و بالتوفيق

د / عمرو سعيد ضيف

أ.د / ناجح عبد الرحمن عبيد الله