

Geology Department Faculty of Sciences Assiut University Fourth level		Second Term Exam Ore forming processes (438 G) June, 2021 Two Hours
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Ore Forming Processes (438g)

Part I: Final exam "50 Marks"

Q1: Shades (T) for true statements or (F) for false statements (1 mark each)

- (1) Mineral deposits genetically linked with the evolution of magma are metamorphic deposits
- (2) Pegmatitic deposits are resulted from the injection of residual magma (feldspar, mica, and quartz)
- (3) Porphyry type deposits have magmatic - hydrothermal genesis.
- (4) Enrichment factor is a factor that make a viable mineral deposit
- (5) Mineral deposits that form after their host rocks are epigenetic type
- (6) Mineralization caused by descending hydrothermal solutions is supergene type deposit
- (7) Cu and Ni are lithophile elements
- (8) Deposits of magmatic segregation are resulted due to separation of ore minerals by fractional crystallization during magmatic differentiation.
- (9) Li, Sn, Zr, U, and W are chalcophile elements
- (10) Cu-Ni sulfides are deposited via magmatic immiscibility process
- (11) Chalcophile elements are typically found associated with felsic and alkaline rocks
- (12) Magma, metamorphism and increase in temperature with depth are the main source of heat in the hydrothermal solutions
- (13) Chromite mineral is deposited via pegmatitic process
- (14) Fractionation of Fe-bearing minerals such as olivine and pyroxene can lead to S-saturation in the residual magma.
- (15) Chromite deposits are associated with basic and ultrabasic rocks
- (16) Hydrothermal ore deposits formed at substantial depths (greater than 4500 meters) and elevated temperatures (400–600 °C) are hypothermal type.
- (17) Hypogene type deposits refer to the mineralization caused by descending hydrothermal solutions.
- (18) The study of the genesis of mineral deposits is defined as metallogeny
- (19) Ore deposits formed from hot solutions of various sources is known as hydrothermal type.
- (20) Pyrometasomatic (skarn) type deposits are formed due to replacement of wall rocks adjacent to an intrusive
- (21) Settling out of sulfide, sulfide-oxide or oxide melts from magmas which accumulate beneath the silicates or are injected into country rocks or extruded on the surface is referred to as magmatic immiscibility processes.
- (22) Metallogenic epoch is a region characterized by a particular assemblage of mineral deposit types.
- (23) The diffusion of ore and gangue forming materials from the country rocks into faults and other structures is named lateral secretion.
- (24) Residual process is the process of leaching soluble elements, and leaving and concentrations of insoluble elements.
- (25) Hydrothermal ore deposits formed at intermediate depths (1500–4500 meters) and temperatures (200–400 °C) called epithermal deposits
- (26) The main factor controlling placer type deposits is specific gravity.
- (27) Hydrothermal ore deposits formed at shallow depths (less than 1500 meters) and fairly low temperatures (50–200 °C) are mesothermal deposits

- (28) Ore is any unnaturally occurring material from which a mineral or aggregate of value can be extracted at a profit.
- (29) Ore forming processes mean understanding the nature and origin of mineral occurrences and how they fit into the Earth system.
- (30) Concentration of heavy minerals into placer due to mechanical accumulation is called residual type deposits
- (31) Diamond deposits are genetically associated with kimberlite rocks.
- (32) The process of leaching of certain elements from the upper part of a mineral deposit and their re-precipitation at depth to produce higher concentrations is defined as supergene enrichment.
- (33) Sn and W deposits are genetically associated with granites.
- (34) Volcanic Exhalative is the process of exhalation sulfide-rich magmas at the surface, usually under marine conditions.
- (35) VMS (volcanogenic massive sulfide) deposits consists of over 90% iron sulfide.
- (36) Magma, groundwater, sea water and chemical reactions during metamorphism are the main sources of water of hydrothermal solutions.
- (37) Crystallization of columbite and tantalite as disseminated grains or segregations in pegmatites is known as residual mineral deposits.
- (38) Diamond deposits are genetically associated with kimberlite rocks.
- (39) Cu, Mo, and Au porphyry type mineralization are genetically related to felsic to intermediate porphyritic intrusions.
- (40) Banded iron ore is formed via magmatic processes.
- (41) Crystallization of ore minerals as disseminated grains or segregations in pegmatites are called porphyry type deposits .
- (42) Cu-Mo porphyry type deposits are formed via magmatic segregation process.
- (43) Specific gravity is the main factor controlling Au-placer deposits.
- (44) Lithophile elements (such as Li, Sn, Zr, U, and W) are typically found in association with felsic or alkaline rock types.
- (45) Banded iron ore in sedimentary rocks is a syngenetic deposits.
- (46) Metals and ligands are the components of ores.
- (47) Surface water is the main source of water in hydrothermal solutions.
- (48) The metals of hydrothermal type deposits could come from magma or be leached from any rock type as water passes through it.
- (49) Evaporite deposits are formed via mechanical weathering.
- (50) Cr, Ni and Pt deposits are genetically associated with oceanic crust.

Part II: Midter, Oral, Activity "30 Marks"

Q2: Shades the correct answer; A, B, C, D (One mark each) (Mid term + oral + activity):

51. Lithophile elements are typically found associated with
(A) basic (B) ultrabasic (C) felsic, (D) intermediate) igneous rocks
52. Porphyry type deposits are spatially and genetically associated with
(A) Serpentinite (B) gabbro (C) granite (D) sandstone
53. In the porphyry type deposits Cu, Au, are derived from
(A) mafic mantle (B) felsic crustal (C) mixing of crustal and mantle (D) sedimentary rocks
54. The inner zone of the hydrothermal alterations related to porphyry type deposits is represented by
(A) phyllic (B) potassic (C) propylitic (D) argillic alteration.
55. VMS deposits are derived via
(A) magmatic fractionation (B) fluid immiscibility, (C) hydrothermal solution
(D) metamorphic process

56. The metal zonation of VMS is represented in the inner zone by
 (A) pyrite and chalcopyrite (B) pyrite- sphalerite - galena (C) sphalerite-galena-pyrite
 (D) chalcopyrite-sphalerite
57. Evaporites are formed via
 (A) mechanical placer (B) chemical, (C) supergene (D) residual process.
58. The main factor controlling the placer deposits is
 (A) pressure (B) temperature (C) specific gravity (D) chemical composition.
59. Residual mineral deposits produced as a result of
 (A) mechanical weathering (B) chemical weathering (C) evaporation
 (D) flowing surface water
- (60) The existing mineral deposits that turned into a more highly concentrated mineral deposits
 by weathering process is named
 (A) secondary enrichment, (B) placer deposits, (C) residual deposits (D) evaporation
- (61) Hot aqueous solutions responsible for the formation of many ore deposits are named
 (A) magma melts (B) saline water (C) hydrothermal solutions (D) ground water
- (62) Mineral Deposits formed from hot aqueous fluids process are named
 (A) magmatic (B) residual (C) hydrothermal (D) skarn type deposits.
- (63) Bauxite and laterite are formed due to
 (A) residual (B) placer (C) chemical weathering (D) metamorphic process.
- (64) Pt—Cr Bushveld, South Africa deposits are formed via
 (A) fluid immiscibility, (B) magmatic segregation (C) pegmatitic (D) residual process.
- (65) Cu – Ni deposits of Sudbury, Canada are formed via
 (A) fluid immiscibility (B) magmatic segregation (C) pegmatitic
 (D) mechanical weathering process.
- (66) Li, deposits of Kings Mtn. N.C. is deposited by
 (A) pegmatitic (B) immiscibility, (C) magmatic fractionation (D) hydrothermal process.
- (67) Skarn type deposits are formed via
 (A) magmatic (B) sedimentary (C) metamorphic (D) hydrothermal process.
- (68) Concentration of heavy minerals into placer is formed via
 (A) mechanical concentration (B) chameical precipitation (C) residual concentration
 (D) supergene enrichment
- (69) Leaching of certain elements from the upper part of a mineral deposit and their re-
 precipitation at depth to produce higher concentrations is named
 (A) supergene enrichment (B) placer deposits (C) residual concentration
 (D) evaporation process.
- (70) Ore deposits that form after their host rocks are
 (A) epigenetic (B) pregenetic (C) syngenetic (D) hypogene deposits.
- (71) Mineralization caused by descending hydrothermal solutions is referred to as
 (A) Hypogene (B) Supergene (C) Hypothermal (D) skarn type
- (72) Epithermal ore deposits are formed at temperatures between
 (A) 50–200 °C (B) 200 – 400°C (C) 400-600 °C (D) > 600 °C
- (73) Ni, Co, PEG and Au are genetically associated with
 (A) basic and ultrabasic (B) acidic (C) intermediate (D) sedimentary rocks
- (74) A region characterized by a particular assemblage of mineral deposit types is called
 (A) metallogeny (B) metallogenic epoch (C) metallogeneic provinces (D) metallotect
- (75) Chalcophile mineralization are genetically related to
 (A) acidic and alkaline (B) basic and ultrabasic (C) intermediate
 (D) metamorphic rocks

- (76) Cr-deposit is formed via
(A) magmatic segregation (B) fluid immiscibility (C) pegmatitic (D) hydrothermal process
- (77) Hydrothermal deposits formed at temperature between 200-400°C are named
(A) epithermal (B) mesothermal (C) hypothermal deposits (D) skarn deposit.
- (78) Under marine conditions VMS deposits formed due to the interaction between hydrothermal solution with
(A) island arc volcanic (B) granite (C) gabbro (D) limestone.
- (79) Ore deposits that form at the same time of their host rocks are called
(A) epigenetic (B) postgenetic (C) syngenetic (D) supergene.
- (80) The alterations of inner zone in VMS deposits is represented by
(A) potassic (B) chloritization (C) sericitization (D) argillic.

GOOD LUCK

Prof. Dr. Mohamed Abdel Moneim



كلية العلوم - قسم الجيولوجيا



امتحان طلاب المستوى الرابع (ساعات معتمدة)
مقرر (٤٤٥ ج) جيولوجيا تصويرية واستشعار عن بعد

الزمن : ٣ ساعات

الدرجة الكلية (٧٠ درجة)

يونيه ٢٠٢١

PART I : Final Exam

PHOTO GEOLOGY (25 marks)

I. Rewrite the following phrases after completing with the correct word :

(one Mark for every word = 19 Marks)

1. It is this difference in parallax on the photographs that produces an illusion of three dimensions when the photographs are viewed stereoscopically and that provides a measure ofdifference.

the orientation - the elevation - the location

2. During aerial photography; if the plane is affected by a cross wind and no correction is made, a condition known asoccurs.

crab - drift - scale variation

3. 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: $h_x - h_y = \dots\dots\dots$, $H = \dots\dots\dots$,
 $h = \dots\dots\dots$, $p = \dots\dots\dots$,
 $W = \dots\dots\dots$

4. The dendritic drainage pattern occurs on relatively such as horizontally bedded sedimentary rock and granite.

thinly laminated - homogeneous materials - soft materials

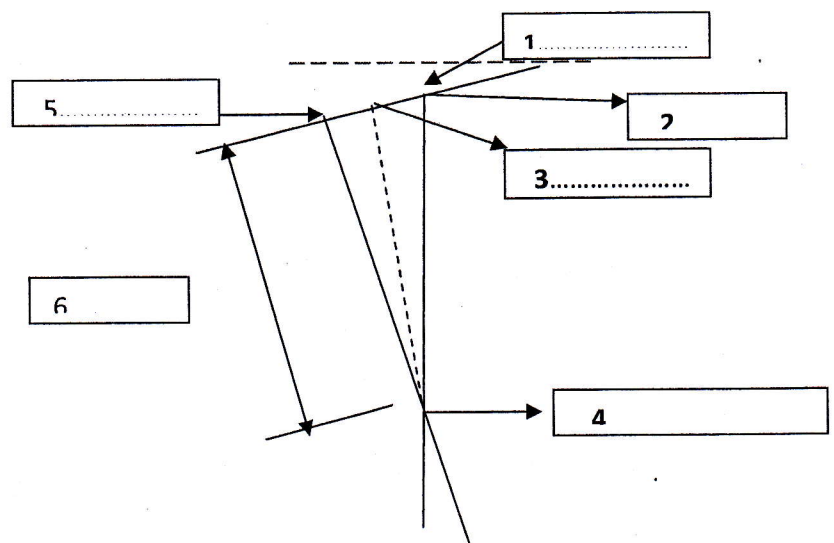
5. A difference in elevation, in addition to producing relief displacement, also produces a difference in

Vertical exaggeration - Parallax - photo tone

باقي الأسئلة في الصفحة التالية

6. The images of ground points with greater elevations are displacedfrom the centre of the photograph causing scale variation .
Outwards - laterally - Inwards - Northwards
7. The scale of a photograph depends upon theof the aeroplane above the ground and the of the camera lens.
flying height - tilt angle - air base - focal length
8. Coarse-textured drainage patterns develop where the soils and rocks havewith little surface runoff.
good internal drainage - poor internal drainage - fine grain size
9. The relation $d = r \cdot h / H$ is used to estimate the relief displacement on aerial photographs;
 where $d =$ $r =$
 $h =$ $H =$
10. Limestone areas are characterized on aerial photographs by the following:
 a).....
 b).....
 c).....

II– Write the correct word of photogrammetric definitions in the blank boxes in the following figure : (6 Marks) - (1 mark each word)



باقى الأسئلة فى الصفحة التالية

REMOTE SENSING (25 marks)

I. Answer TWO questions ONLY of the following, illustrating your answers with diagrams:

1. Give short notes about : (2 marks each)

- Interaction mechanism between EMR and matter.
- Radiation.
- Image contrast.
- Detectability and recognizability.
- Resolution and resolving power.
- Special reflectance curves.

2. Comment in detail on:

- Remote sensing bands. (4marks)
- Atmospheric effects. (4.5 marks)
- Orbit paths of Landsat. (4 marks)

3. Write what you know about:

- Lineaments. (3marks)
- Lineament metalotects. (3.5 marks)
- Linear Plutons. (3marks)
- Width and length of scan line. (3marks)

PART II. ORAL and MIDTERM EXAM (20 Marks)

1. Write the proper word as indicated in the figure (A) PHOTOGEOLOGY



1.....

2.....

3.....

4.....

5.....

باقى الأسئلة فى الصفحة التالية

2. Sandstone outcrops are characterized by the following features on aerial photographs

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

3. The trellis drainage pattern occurs in areas of

folded sedimentary rocks – plateau surface - oval igneous intrusions

(B) REMOTE SENSING

Answer One Question Only of the following:

1. Comparison in reflectance between:

- a) Basalt and Limestone rocks
- b) Basalt and Andesite
- c) Granite and fresh Rhyolite

2. Compare in reflectance between:

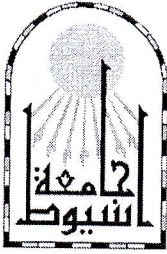
- a) Fresh and weathered rocks
- b) Surface and volume phenomena.

3. Discuss the sentence : radiation may be: transmitted, absorbed, emitted, scattered and reflected

GOOD LUCK _____

Prof. Dr. Moustafa M. Youssef

Prof.Dr.Mohammed E.Habib



امتحان التحريرى لطلاب المستوى الرابع بكلية العلوم شعبة الجيولوجيا
المقرر: بيئة الأحياء القديمة وطباقية حياتية (٤١٤ ج)

Palaeoecology & Biostratigraphy 414G

دور يونيو - العام الجامعى ٢٠٢٠-٢٠٢١م

الزمن: ساعتان

الدرجة الكلية للامتحان: ٨٠ درجة (درجة واحدة لكل سؤال من رقم ١ حتى رقم ٨٠)

ملحوظات هامة: - الامتحان يتكون من أربع صفحات والاجابة تكون على ورقة الأسئلة

• Section I: Final exam

(50 marks)

Q1: Choose (✓) for true statements or (X) for false statements (1 mark each)

Palaeoecology ↓

- 1- The term "ecosystem" refers only to the environmental variables ().
- 2- Paleoeecology is interested in studying the interaction of organisms with one another and with the physical environment in present-day environments ().
- 3- Necrology is an alternative synonymous term of biostratinomy ().
- 4- Dinoflagellates can be used to infer oceanic paleotemperatures ().
- 5- Many organisms can be destructed during the biostratinomic stage ().
- 6- Diatoms are good depth indicators in the marine environment ().
- 7- Post-mortem destruction in most organisms is total ().
- 8- The operational base "analogy" is intermediate between substantive and methodologic uniformitarianism ().
- 9- Most living animals moving in water or air are streamlined ().
- 10- Unaltered preserved body parts of organisms are the only known constituents that contribute significantly to the paleoecology work ().
- 11- Both megafossils and microfossils are required and incorporated in paleoecology investigations ().
- 12- Understanding relationship of fossil assemblage to original community can allow reconstruction of the community ().
- 13- Processes of fossil formation can be inferred by studying taphonomy ().
- 14- Fossil data are essentially used to reconstruct present-day environments ().
- 15- Fossilized plants and animals imply that they passed through post-mortem stages ().

Biostratigraphy ↓

- 16- A paraconformity is an erosional surface between igneous and sedimentary rocks ().
- 17- Abundance zone is characterized by a peak of one taxon ().
- 18- Boundaries between biostratigraphic units usually coincide with local lithostratigraphic units ().
- 19- Rock intervals that lack any fossils are not subject to biostratigraphic classification ().
- 20- Biostratigraphy is a chronostratigraphic dating technique ().
- 21- Fossils are particularly valuable in time-correlation of strata because of the progressive and the, more or less, orderly evolution of life forms ().
- 22- Biozones are the fundamental units used in lithostratigraphy ().

- 23- The basis of biostratigraphic analysis is only controlled by extinction events ().
- 24- The range from the lowest to the highest occurrence of a given taxon defines the "Concurrent Range Zone" ().
- 25- Biostratigraphic rules are used to place rocks and events in local order and to correlate sequences ().
- 26- "Assemblage Zone" is a zone that is characterized by the occurrence of one taxon ().
- 27- The evolution of the zone concept has resulted in numerous kinds of zones and quite a varied terminology ().
- 28- A species cannot be found in a particular sedimentary succession due to numerous reasons ().
- 29- The "Partial Range Zone" is a modification of the "Concurrent Range Zone" ().
- 30- Last appearance datum means the time of evolutionary origin of a certain taxon ().

Q2: Choose the correct answer from A, B, C or D (1 mark each)

***Palaeoecology* ↓**

- 31- Ecology is the study of the interactions of organisms with one another and with the physical environment in the:
A- present times B- geologic past C- Quaternary D- Precambrian
- 32- Dinoflagellates are good paleoenvironmental indicators because they are:
A- diverse B- of slow evolution rates C- of short geologic history D- not diverse
- 33- The sedimentational history of the fossil is termed:
A- ontogeny B- diagenesis C- fossil decay D- biostratigraphy
- 34- The paleoecologist is able to examine the ancient ecosystems and:
A- infer paleoenvironments B- examine ecosystem living organisms
C- recognize paleolatitudes D- measure ecosystem gradients
- 35- Dinoflagellates in the modern seas can reflect the following except of:
A- sea surface temperatures B- bioturbation
C- sea surface salinities D- turbulence
- 36- Plants may contribute to the fossil record even if they are still living because they:
A- live longer B- die easily
C- have shorter life span D- have parts die while the parent plant is still living
- 37- The organic matter beneath the top layer of leaves of a given forest-floor may have been:
A- degraded to an unrecognizable form B- protected from decay
C- completely removed by erosion D- degraded by marine organisms
- 38- Recycling of the organic matter after burial keeps the carbon, nitrogen, and sulfur cycles:
A- terminating B- operating C- closing D- distorted
- 39- Comprehensive ecologic background is necessary for studying:
A- dendrology B- paleoecology C- biostratigraphy D- lithostratigraphy
- 40- Which of the following do not belong systematically to calcareous algae?
A- stromatolites B- codiacians C- silicoflagellates D- coralline algae

***Biostratigraphy* ↓**

- 41- Which of the following time period is the shortest?
A- Precambrian B- Paleozoic C- Mesozoic D- Cenozoic
- 42- Normally life forms are preserved as fossils in rocks:
A- sedimentary B- volcanic C- plutonic D- metamorphic

- 43- The study of faunal successions allows:
 A- matching and correlating similarly-aged rocks from different outcrops
 B- absolute dating of fossil-bearing strata
 C- recognizing pre-Cambrian climates
 D- studying morphologies of extinct mammals
- 44- One of the most significant bio-events is the:
 A- extinction of rare species B- continuous occurrence of older taxa
 C- mass extinction of few taxa D- mass extinction of multiple taxa
- 45- Ideal species for biostratigraphic correlation should essentially be:
 A- rare B- Geographically widespread
 C- long ranging D- morphologically complicated
- 46- One of the following is not an era of the Phanerozoic eon:
 A- the Paleozoic B- Archean C- the Mesozoic D- the Cenozoic
- 47- The basic principle of biostratigraphy is that evolutionary changes in biotas are:
 A- reversible B- rare C- nonreversible D- impossible
- 48- "Taxon Range Zone" must have been temporarily named:
 A- florizone B- acme zone C- teil zone D- lineage zone
- 49- Which of the following is not a barrier to fossil dispersal?
 A- temperature B- geography C- plate movements D- geomorphology
- 50- Abundant and widespread taxa are often resistant to extinction, therefore they are:
 A- rare B- long-ranging C- absent D- short-ranging

• **Section II: Other exams (midterm, semester activities, oral)**
(30 marks)

Q3: Choose (✓) for true statements or (X) for false statements (1 mark each)

***Palaeoecology* ↓**

- 51- Studying populations within the physical and biological environment is termed synecology ().
- 52- Many environmental values may be important, but some of them are more significant than others in paleoecology reconstruction ().
- 53- Chemical taphonomic effects include early changes in mineralogy ().
- 54- *Acropora palmata* live in restricted to very shallow turbulent water in modern open reef environments ().
- 55- Plant microfossils can be good environmental indicators ().
- 56- Every organism that ever lived could certainly be preserved as fossil ().
- 57- Taphonomic impacts include several effects such as abrasion, articulation, bioerosion, dissolution, fragmentation and rounding ().
- 58- During last decades paleoecology became a major component of paleontology ().
- 59- The paleoecologist is not able by direct observation to examine the ecosystems ().
- 60- Trace fossils can contribute significantly to oceanographic gradients ().
- 61- The taxonomic uniformitarian approach is usually applied by the paleoecologists ().
- 62- Differential preservation may cause the final assemblage investigated by the paleoecologist to be quite different from the original living one ().

- 43- The study of faunal successions follows:
 A- matching and correlating similarly-aged rocks from different outcrops
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 C- recognizing pre-Cambrian climates
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- 44- One of the most significant bio-events is the:
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 A- the Paleozoic
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 C- the Mesozoic
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- 47- The basic principle of biostratigraphy is that evolutionary changes in biotas are:
 A- reversible
 B- rare
 C- nonreversible
 D- impossible
- 48- "Faunal Range Zone" must has been temporarily named:
 A- Eozonae
 B- some zone
 C- nektonic
 D- litane zone
- 49- Which of the following is not a barrier against dispersal?
 A- temperature
 B- geography
 C- plate movements
 D- geomorphology
- 50- Abundant and widespread taxa are often resistant to extinction, therefore they are:
 A- rare
 B- long-ranging
 C- absent
 D- short-ranging

Section II: Other exams (midterm, semester activities, oral)

(30 marks)

- Q1: Choose (✓) for true statements or (X) for false statements (1 mark each)
- 1- Paleontology is the study of fossils. (✓)
- 2- Study of populations within the physical and biological environment is termed paleontology. (X)
- 3- Many environmental values may be important, but some of them are more significant than others in paleontology reconstruction. (✓)
- 4- Chemical taphonomic effects include early changes in mineralogy. (✓)
- 5- A few organisms live in restricted to very shallow turbulent water in modern open reef environments. (X)
- 6- Plant microfossils can be good environmental indicators. (✓)
- 7- Every organism that ever lived could certainly be preserved as fossil. (X)
- 8- Taphonomic impacts include several effects such as abrasion, attrition, bioerosion, dissolution, leaching and rounding. (✓)
- 9- During last decades paleontology became a major component of paleontology. (X)
- 10- The paleontologist is not able to detect or identify in examining the rock strata. (X)
- 11- Trace fossils can contribute significantly to oceanographic gradients. (✓)
- 12- The enormous uniformitarian approach is usually applied by the paleontologists. (X)
- 13- Differential preservation may cause the fossil assemblage represented by the paleontologist to be quite different from the original living one. (X)

- 63- Invertebrate fossils are considered an essential source of data-base in paleoecological reconstruction ().
- 64- The actual number of species inhabiting the Earth today is still unknown ().
- 65- The substantive uniformitarian approach is largely abandoned because earth materials have remained constant ().

Biostratigraphy ↓

- 66- Biostratigraphy means dividing rock units based on differences in their lithological content ().
- 67- Physical or climatic barriers are considered as biogeographic provinces ().
- 68- Biostratigraphic intervals are defined by the occurrence of one or more fossil taxa ().
- 69- Temperature is one of the most important variable controlling distributions of most organisms ().
- 70- Applications of paleontology cannot be applied to solve geological problems ().
- 71- Ideal index fossils are morphologically distinctive ().
- 72- The natural biological assemblage with taxa that live together in a particular habitat is termed "Thanatocoenosis" ().
- 73- The ideal taxon should be of long temporal span ().
- 74- Sediments of the same age can look completely different but if they contain same fossils they are likely to have been deposited at the same time ().
- 75- The "Lineage Zone" defines a zone of successive phylogenetically-related taxa ().
- 76- Paleontologic clocks are not considered time-keepers ().
- 77- The biostratigraphy can be an indicator of modern environments ().
- 78- In practice, abundance zones are difficult to use except of local situations ().
- 79- Biostratigraphy is the application of pseudofossils for the correlation and age determination of sedimentary rocks ().
- 80- The large faunas of the Paleozoic are dominated by vertebrates ().

إنتهت الأسئلة مع أطيب الأمنيات بالتوفيق

Examiner:

Prof. Dr. Magdy S. Mahmoud (Geology Department)

بسم الله الرحمن الرحيم

جامعة أسيوط
كلية العلوم
قسم الجيولوجيا

Assiut University
Faculty of science
Geology Department

امتحان المستوى الرابع (شعبتي الجيولوجيا والجيوفيزياء)

مقرر ٤١٥ ج (جيولوجية مصر)

Course 415 G (Geology of Egypt)

الزمن : ثلاث ساعات

الدرجة: ٥٠ درجة

دور يوليو 2021

الإمتحان مكون من خمسة صفحات

Part I (Precambrian) 10 Marks

Answer only **ONE** question of the following using drawing when possible (10 Marks)

Question 1- A):

Compare and contrast between the younger island arc volcanics and the older volcanics of the ophiolite association. (10 marks)

Question 1- B:

Write on the evidences against the presence of pre- Pan-African infrastructural rocks in the Eastern Desert of Egypt. (10 marks)

Part II (Phanerozoic) 30 Marks

Answer only **THREE** questions of the following:

Question 2 (10 Marks)

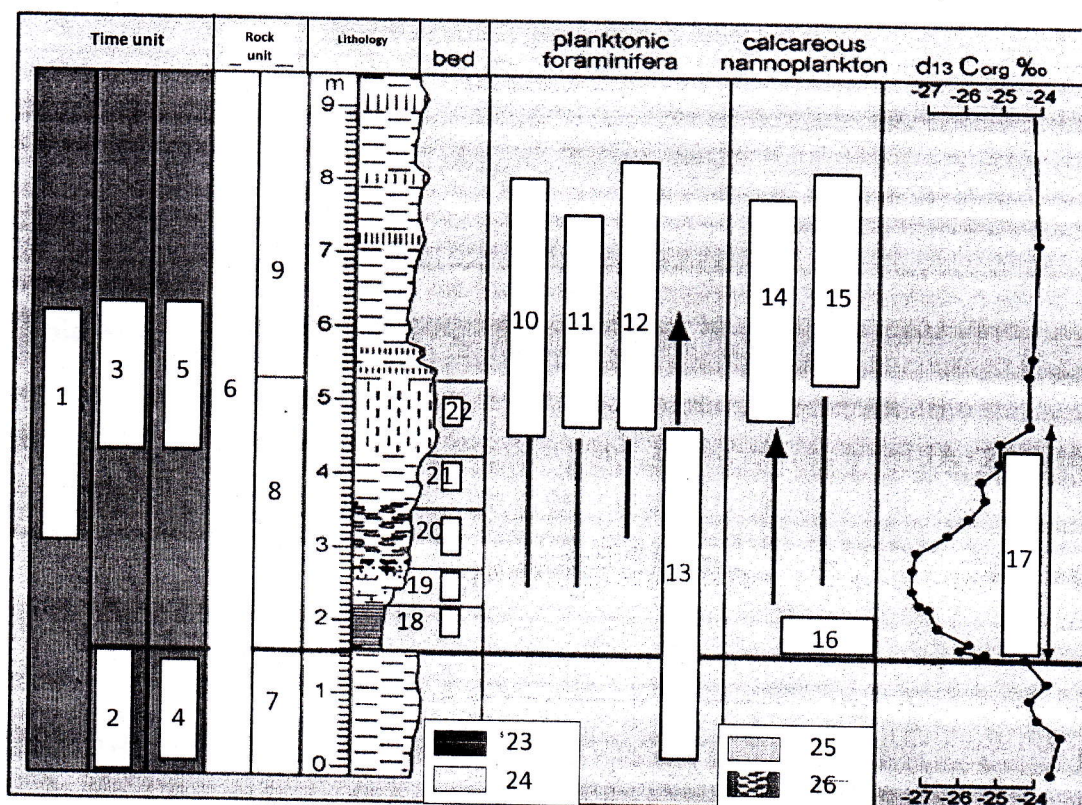
2- Compare and correlate the Middle –Upper Eocene rock units and their equivalent time units in Fayoum, Nile Valley, Cairo and Sinai. (10 Marks)

Question 3 (10 Marks)

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

Question 4 (A-B) (10 Marks)

4-A: 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. (5 Marks)



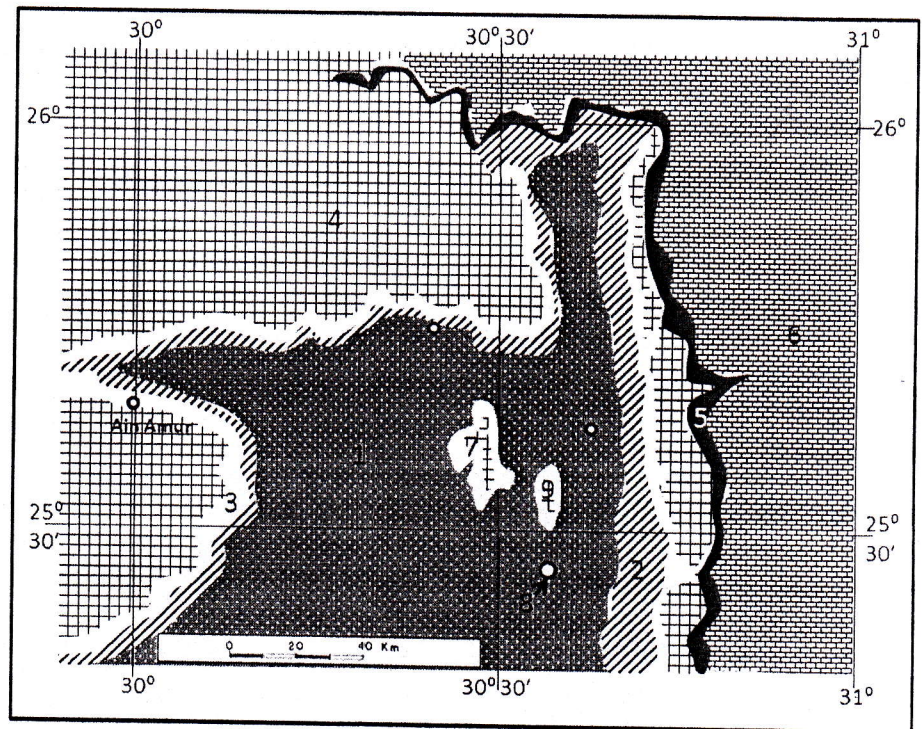
4- B: Mark the correct word from the three words in the brackets (5 Marks)

1. The Alamein Member is dolomitic limestone belonging to the (Lower Cretaceous) (Upper Cretaceous) (Upper Jurassic) age
2. The Jurassic Wadi Natrun Formation is made up of (dolomitic limestone) (sandstone) (shale)
3. Fossiliferous Devonian strata were identified in (10) (5) (3) wells in the subsurface of the northern Western Desert
4. Cambrian Strata were fully penetrated in (5) (10) (3) wells in the subsurface of the northern Western Desert
5. Bahrein Formation is (Jurassic) (Cretaceous) (Silurian) in age

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

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

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



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

List I

Kiseiba Formation
Belayim Formation
Garra Formation
Dabaa Formation
Birket Qarun Formation
Mamura Formation
Ryan Formation
Qawasim Formtion
Bahariya Formation
Kareem Formation

List II

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

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

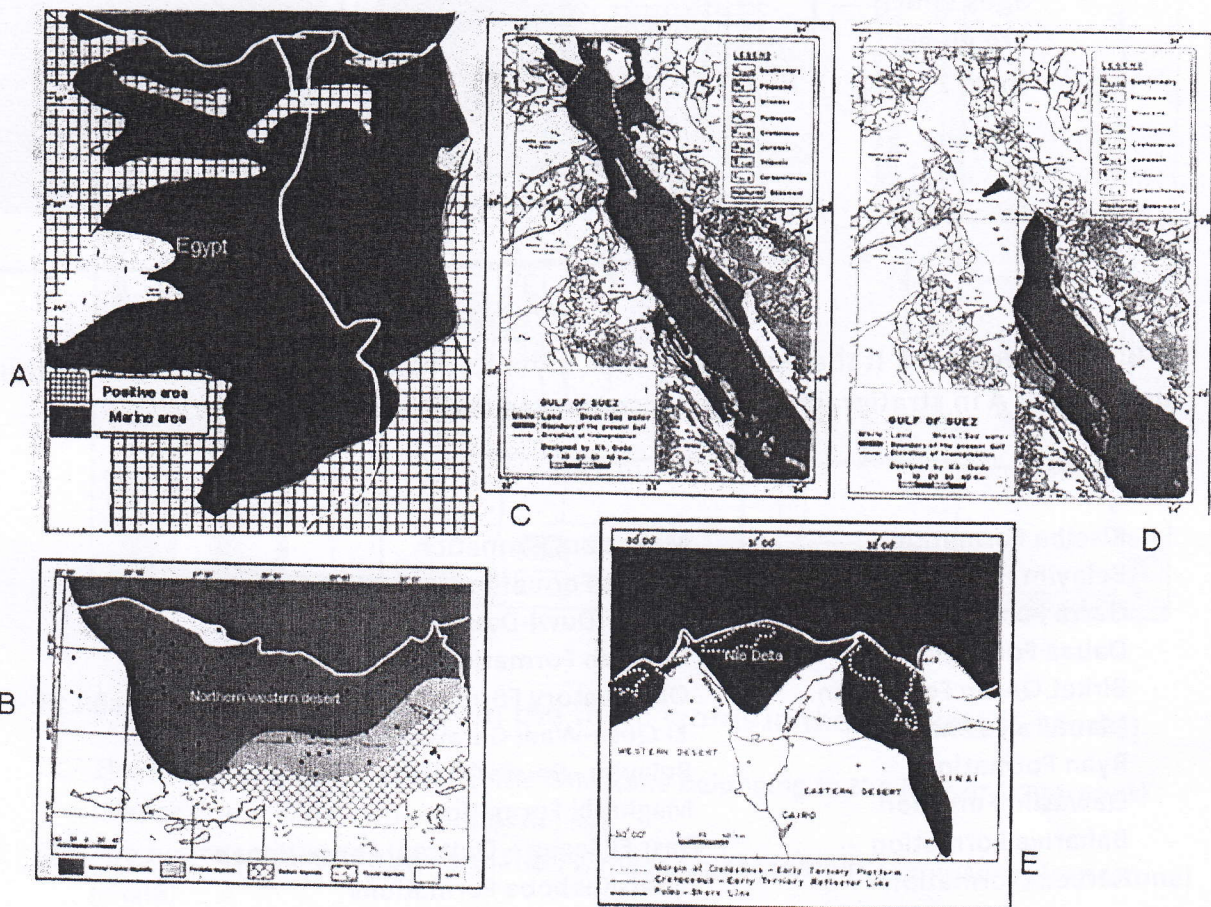
Answer the following question

Question 6 (A, B and C) (10 Marks)

6-A: Answer ONLY ONE question of the following: (3.5 Marks)

- a- Summarize the Egyptian granite classification suggested by El-Gaby and Habib (1982).
- b- Write short notes on the Fawakhier ophiolite sequence.

6-B: Look to the following paleogeographic maps and define the Period, Epoch and Absolute age during which the Egyptian land was submerged (black color) in a way such as in figures A, B, C, D and E. (2.5 Marks)



6-C: You have a correlation chart of the rock units exposed between the Gilf El Kebir at west and Dakhla -Kharga stretch at east in the southern Western Desert. Define the rock units from 1 to 12 and the time units from 13 to 16 in the chart (4 Marks)

Assiut University
Faculty of Science
Department of Geology



Date: June 2021
Time allowed: 2 hours

Final Exam

Geothermal and Radiometric Methods(G452), Total 80 Marks

A) Mark the following statements with True (✓) or False (X): (50marks, onemark each)

Statement	True (✓)	False (X)
1. Atomic number is the total number of protons and neutrons whereas the atomic mass is the number of protons		
2. Isotopes are defined as an element whose atoms have a different number of protons and electrons but similar number of neutrons in the nucleus		
3. In radiometric survey, the most significant isotopes are uranium, thorium, and potassium		
4. Radioactivity is the process where a stable atom becomes unstable through the process of decay or breakdown of its nucleus		
5. Radiation is the energy in the form of particles or waves that travel from one object to another		
6. Ionization is the process of removing electrons from atoms to make charged atoms called ions		
7. Alpha radiation is electrons whereas Beta radiation is helium nuclei		
8. Gamma rays are parcels of electromagnetic radiations similar to visible light		
9. The energy of gamma ray is not a characteristic of the radioactive element it came from		
10. Gamma ray has higher energy than X-Ray		
11. The emission of Gamma ray is a secondary phenomenon that generally accompanies the emissions of Alpha and Beta particles		
12. Alpha and Beta particles can ionize gas and make it electrically conductive		
13. Radiometric can be used as a mapping tool for certain rock types change		
14. A radiometric survey measure the spatial distribution of radioactive elements in the top 30-45 meters of the earth's crust		
15. Curie unit is used for the intensity of Gamma ray radiation whereas the		
16. Roentgen is used for the activity of radioactive specimen		
17. The radioactive decay processes can be affected by the chemical and physical processes in the surroundings		

18. The time it takes for one half of the material to decay or disintegrate is called the half-life time		
19. In radioactive decay process, the rate of accumulation of daughter atoms is the difference between production and decay		
20. The range of half-life times of radioactive nuclei does not vary enormously		
21. The radioactive decay of uranium and thorium elements leads to unstable isotopes of lead		
22. The radioactivity in sedimentary rocks is lower than the igneous rocks		
23. The majority of clay minerals are characterized by high radioactivity		
24. Limestones and dolomite can be classified as rocks with low/weak radioactivity		
25. Studying the radioactivity of rocks and minerals can provide useful information about the heat production with the earth		
26. One of the assumptions made in radiometric dating is that no loss or gain of parent or daughter		
27. The advantage of Potassium-Aragon age dating is the wide spread of potassium element in the crustal rocks		
28. The disadvantage of Potassium-Aragon age dating is the vulnerability of Aragon gas to be lost by alteration or heating		
29. The ^{87}Rb has only one half-life time		
30. Zircon (accessory mineral) is the most commonly mineral used for U-Th-Pb age dating		
31. The ^{14}C method has mainly been used for dating plant material in addition to glacier ice		
32. The $^{18}\text{O}/^{16}\text{O}$ ratio provides a record of ancient water temperature		
33. The natural $^{18}\text{O}/^{16}\text{O}$ ratio is approximately 1/200		
34. Geiger-Muller counter can be used for land and airborne radiometric survey		
35. Gamma Ray Spectrometer express the spectrum (^{238}U , ^{232}Th , and ^{40}K) in terms of energy levels that provide a diagnostic mean of discriminating between different sources		
36. The Gamma Ray Spectrometer can be calibrated by flying over an area of known radioisotope concentration		
37. Radon Emanometer can not be used to map faults		
38. The interpretation of radiometric data are mostly qualitative		
39. The instruments for radiometric are based on the number counts of emissions over a fixed period of time		
40. In order for the Geiger counter tube to restore itself quickly to its original state after radiation has entered, a gas is added to the tube		
41. The scintillation meter is based on the phenomena		

that certain substances convert gamma rays to light (they scintillate)		
42. Geiger-Muller counter respond to Gamma radiation only		
43. The scintillation meters respond to Gamma and beta radiations		
44. The presence of radon at the surface indicate buried Rubidium concentrations		
45. The Gamma ray spectrometric survey can be car-borne only		
46. Radon emanometer measurements can be done on groundwater samples from shallow drill hole		
47. Viewing of existing information is not necessary for the planning of radiometric survey		
48. Selection of the radiometric survey method depends on the objectives, time and cost of the survey.		
49. The airborne radiometric survey is conducted to cover a large area in short time		
50. Granite rocks will produce high anomaly compared to Tuff in radiometric survey		

**B) Choose the correct answer of the following: (Midterm, activities and oral)
(30marks, one mark each)**

51) The atomic mass is defined as:

- a) the number of protons
- b) the number of neutrons
- c) the number of protons and electrons
- d) the number of protons and neutrons

52) During decay, energy is released in the form of:

- a) Alpha particles
- b) Beta particles
- c) Gamma radiation
- d) all of the above

53) The process that takes place when an electron from the innermost (K) shell enters the nucleus is called:

- a) K shift
- b) K release
- c) K capture
- d) K detection

54) Maximum energy in natural disintegration is generally less than:

- a) 3 Mev
- b) 10 MeV
- c) 15 MeV
- d) 30 MeV

55) Ionizing radiation of Alpha and Beta particles can:

- a) affect photographic emulsion
- b) ionize gas
- c) produce scintillations
- d) all of the above

- 56) The following consider non-ionizing radiation:
- a) Gamma ray
 - b) X- ray
 - c) Microwave
 - d) all of the above
- 57) In radiometric survey the Gamma ray is detecting by:
- a) resistivity meter
 - b) voltmeter
 - c) spectrometer
 - d) nanometer
- 58) Which of the following is the measure of the activity of radioactive specimen:
- a) Roentgen
 - b) Curi
 - c) Total counts
 - d) all of the above
- 59) Roentgen is a unit for measuring the intensity of:
- a) Alpha particles
 - b) Beta particles
 - c) Gamma radiation
 - d) all of the above
- 60) The quantity of radiation that will produce one electrostatic unit of charge per cubic centimetre in air at 0° C and 760 Torr is called:
- a) Curi
 - b) Total counts
 - c) Roentgen
 - d) none of the above
- 61) Radioactive decay processes can be affected by:
- a) Physical processes of the surroundings
 - b) Chemical processes of the surroundings
 - c) Physical and Chemical processes of the surroundings
 - d) none of the above
- 62) Isotopes are the basis of radiometric dating of rocks because:
- a) the known decay constant of isotopes
 - b) they are unaffected by physical and chemical processes
 - c) a and b
 - d) none of the above
- 63) Sandstones and gneiss rocks are generally characterized by:
- a) high radioactivity
 - b) intermediate radioactivity
 - c) week radioactivity
 - d) all of the above
- 64) Mafic and ultramafic rocks are generally characterized by:
- a) high radioactivity
 - b) intermediate radioactivity
 - c) week radioactivity
 - d) all of the above

- 65) The importance of studying radioactivity of rocks and minerals are:
- a) in selection of rock materials for age dating
 - b) in calculation of heat production within the earth
 - c) in the search for deposits of radioactive minerals
 - d) all of the above
- 66) The parent/daughter ratio can be determined using:
- a) flow meter
 - b) spectrometer
 - c) resistivity meter
 - d) cyclometer
- 67) One of the assumptions made in radiometric dating is:
- a) no loss or gain of parent or daughter
 - b) unknown decay constant
 - c) unknown half-life time
 - d) all of the above
- 68) Accurate age dating method must fulfil the following:
- a) a decay only one way
 - b) no other source of daughter
 - c) both daughter and parent stay in place
 - d) all of the above
- 69) The error in age dating methods may result from:
- a) branching decay
 - b) no other source of daughter
 - c) metamorphism
 - d) a and c
- 70) The most age dating methods are:
- a) Potassium-Aragon
 - b) Uranium-Lead
 - c) Rubidium- Strontium
 - d) all of the above
- 71) The only stable isotope of calcium is:
- a) Ca^{10}
 - b) Ca^{20}
 - c) Ca^{30}
 - d) Ca^{40}
- 72) The dated event using Potassium-Aragon method is the time of final cooling below approximately:
- a) 200°C
 - b) 300°C
 - c) 500°C
 - d) 1000°C
- 73) The advantage of Rubidium-Strontium age data is that the system is:
- a) Gas-Gas
 - b) Solid-Gas
 - c) Solid-Solid
 - d) none of the above

- 74) Tritium is the radioactive isotope of:
- a) Carbon
 - b) Oxygen
 - c) Sodium
 - d) Hydrogen
- 75) The tritium age dating method can be used to determine:
- a) age of the Earth
 - b) age of planet
 - c) age and recharge of groundwater
 - d) age of glacier ice
- 76) The following minerals are suitable for K-Ar age dating:
- a) Hornblende
 - b) Orthoclase
 - c) Microcline
 - d) all of the above
- 77) The disadvantage of ^{87}Rb - ^{87}Sr age dating method is:
- a) Rb is not abundant element in the crust
 - b) cannot apply to young rocks due to long half-life
 - c) the initial presence of non-radiogenic Sr in most minerals
 - d) all of the above
- 78) The ancient climatic features are derived from analyses of:
- a) Tritium isotopes
 - b) Uranium isotopes
 - c) Oxygen isotopes
 - d) Carbon isotopes
- 79) The number of naturally occurring isotopes of Oxygen is:
- a) two
 - b) three
 - c) four
 - d) five
- 80) which of the following instruments can be used in radiometric survey:
- a) Geiger-Muller Counter
 - b) Scintillation Meter
 - c) Gamma-ray Spectrometer
 - d) all of the above

End of questions

Good Luck

Course Instructor: Prof. Dr. Gamal Zidan Abdelaal



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

Time: Two Hours 19 June, 2021

**PART-I: Sedimentary Basins (Total Marks 40)
(FINAL EXAM-Total Marks 25)**

Answer the following question:

- 1- a. What is a sedimentary basin? (5 marks)
- b. Mention the terminology used to describe basins prior to the development of the theory of Plate Tectonics?

Answer two questions only from the following:

- 2- a. Choose the correct answer (4 marks)
- Rift basins are caused by plate divergence
 - Rift basins are caused by plate convergence
- b. What is the economic significance of rift basins? (4 marks)
- 3- a. Mention the Subduction-related basins. (4 marks)
- b. Backarc basins are formed in:
- Subduction-related basins
 - Divergent-related basins
 - Collision-related basins (4 marks)

4- a. Choose the correct answer

(4 marks)

The pull apart basins are:

- Strike-Slip/Transform fault basins
- Rift basins
- Both

b. Describe briefly the sedimentary fill of pull apart basin

11-Other Exams (Activity, Midterm and Oral-15 Mark)

1. The Divergent plate margin basins include:

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

2. Molasse sediments occurs in:

- ☐ Foreland basins
- ☐ Backarc basins
- ☐ Pull apart Basins

3. What is a pre-depositional basin?

امتحان مادة جيولوجيا الاثار (٤٥٨ ج)
الفصل الدراسي الثاني - العام الجامعي (٢٠٢٠/٢٠٢١)

الزمن ساعتان

المستوى الرابع

اولا امتحان التحريرى (٥٠ درجة)

Chose the correct answer

- 1- Plaster essentially differs from mortar by:
 - A) Containing a temper dominated by sand rather than gravel-size material.
 - B) Containing dominate Silica rather than feldspar
- 2- The stones which used in the form of finely dressed blocks or slabs or columns in monumental and costly buildings were:
 - A) Granites & marbles
 - (B) Limestone
 - (C) Sandstone
- 3- Calcareous-sandstone temple at Qasr el-Sagha in northern Faiyum belongs to:
 - A) Middle Kingdom
 - B) Early Kingdom
 - C) Late Kingdom
- 4- Seasoning of stones :
 - A) Makes the stone more darker
 - (B) Makes the stone hard and compact
- 5- The study of the evolution of the landforms:
 - A) Geomorphology
 - B) Geochemistry
 - C) Petrography
- 6- The stones of Hibis sandstone temple were probably coming from the
 - A) Gebel el-Teir quarry
 - B) Eastern Desert
 - C) Minia quarry

- 7- From Early Dynastic times onward, the material of choice within the region for pyramids, mastaba tombs, and temples was.
- A) Sandstone (B) Limestone (C) Gravels
- 8- Tools to re-create ancient landscapes:
- A) Geomorphology and sedimentology
B) Historical geology
C) Mineralogy
- 9- Obsidian flakes mark the beginning of trade around the Aegean by about
- A) 5000 BC.
B) 4000 BC.
C) 3000 BC.
- 10- In the case of the walls, the position of the stone blocks should be:
- A) Same in which they were originally deposited
B) Perpendicular in which they were originally deposited
- 11- Soil phosphate mapping is the most widely used chemical method involved in archaeological site prospecting, because :
- A) Phosphate is so readily fixed to soil particles after the decomposition of organic material.
B) Phosphate is more abundant in the soli
C) Phosphate is easily to analyses
- 12- Artifacts are usually found:
- (A) Located in the surface (B) Buried in the ground
- 13- Archaeologists study past cultures by examining:
- a) Rocks (B) Soil (C) Artifacts
- 14- Provenance of artifacts determined by techniques such as:
- (A) Mineralogy (B) Petrography (C) Trace elements
(D) Stable isotopes (E) All of them
- 15- The term mortar refers to a mixture of:
- (A) Sand and gravel (B) Quicklime with sand and water (C) Silica and feldspar

- 16- Prehistoric archaeological sites dated:
(A) After written history (B) Before written history.
- 17- Favored site for urban civilizations:
A) along and in the floodplains of great river systems
B) Near seas (C) In the Desert areas
- 18- A chemical sedimentary rock resulting from precipitation of silica from seawater and recorded in many prehistoric sites:
A) Limestone (B) Phosphate (C) Chert
- 19- Pottery is the general term for artifacts made mostly of
(A) Granite (B) Clay (C) Limestone
- 20- The building stone should be:
(A) Hard, strong and durable (B) Soft (C) Light in colour
- 21- Plaster of Paris" is manufactured by heatingwhich rehydrates in the presence of water.
(A) Silica (B) Gypsum (C) Anhydrite
- 22- During this period almost all important gold mining sites in the Eastern Desert of Egypt and in the Nubian Desert were discovered and exploited:
A) During the relatively short span of 140 years between Thutmosis III and Amenophis IV (roughly 1480–1340 BC).
B) Early Dynastic times (C) During the Islamic time
- 23- The shared ways of life learned by a group of people, including their language, religion, technology, and values:
A) History (B) Culture (C) Geology
- 24- Assist in evaluate the effects of post-depositional environment on the condition or safety of the archeological deposits:
A) Geomorphological and geoarchaeological investigations
B) Geophysical exploration (C) Geochemical investigation
- 25- The primary raw material for archeological ceramics is :
(A) Gypsum (B) clay-rich sediments (C) quartz

ثانياً: امتحان الشفوى – اعمال السنه – منتصف الفصل (٣٠ درجة)

ضع علامة صح امام الاجابة الصحيحة و علامة خطأ امام الاجابة الخطأ

1. Marble is a microcrystalline quartz with few traces of chemical impurities.
2. Limestone is considered as the primary raw material for archeological ceramics.
3. Hematite is sometimes known as green Ocher.
4. Red ocher has been used for decorations since at least the Mousterian tradition.
5. Stable isotopes (isotopic ratios of oxygen, carbon, and strontium) are used for classical marbles and strontium for alabaster and gypsum.
6. The gold occurrences are located in the Precambrian basement of Egypt and Sudan, also called the Arabian–Nubian shield (ANS).
7. Archaeomineralogy provides a wealth of information for mineralogists, geologists and archaeologists involved in archaeometric studies of our past.
8. The most common geochemical method in archaeology is soil phosphate analysis.
9. Prehistoric sites occurred after the culture began writing records of daily life.
10. Prehistory is more of a puzzle because most of what we know about prehistoric people is from the artifacts they left behind
11. Geoarcheology helps in understanding the climatic changes between wet and dry periods that prevailed in the Western Desert.
12. Geoarcheology threw lights on the behavior of the River Nile (aggradation and degradation phases) during Late Pleistocene and Holocene times.
13. Diorite and gabbro were the main building stones of ancient Egypt.
14. Abrasion resistance and Fire resistance are the main physical properties of building stones.
15. The plane along which stones can be easily split is known as natural bed of stone

أ.د. جلال الحباك

تمت الاسئلة وبالتوفيق



Faculty of science

Department of Mathematics

Final Term Exam (2nd Term)

Fourth year student (Math)

Course: Complex Analysis

Code: 412 M

Time : 3 Hours

Points : 100 Points

Date: Saturday, 19 June 2021



Assiut University

الإمتحان مُكون من جزئين: الجزء الأول (النهائي) يشمل 25 سؤال اختيار من متعدد والجزء الثاني (منتصف الترم+الأعمال+الشفوي) يشمل 25 سؤال صح/خطأ- لكل سؤال درجتين- تقع الأسئلة في خمس صفحات- مطلوب الإجابة عنها جميعاً

الجزء الأول: النهائي (50 درجة)

Multiple Choice Questions. Choose the correct answer from the given four options (1-25):

1) If $z \neq 0 \in \mathbb{C}$, then $\frac{|z|^2}{z}$ is equal to

- (a) z (b) $|z|$ (c) $\frac{1}{\bar{z}}$ (d) none of these

2) $\text{Arg}(\log(1 + i)) = \dots\dots\dots$

- (a) $\log \sqrt{2} + i \frac{\pi}{2}$ (b) $i \frac{\pi}{4}$ (c) $\frac{1}{2} \log(2) + i \frac{\pi}{4}$ (d) $\log(2) + i \frac{\pi}{2}$

3) If $z \neq 0 \in \mathbb{C}$, the value of $\arg(z) + \arg(\bar{z})$ is

- (a) π (b) 0 (c) $\frac{\pi}{2}$ (d) $-\frac{\pi}{2}$

4) If $|z| = 4$ and $\arg(z) = -\frac{\pi}{4}$, then z is equal to

- (a) $2\sqrt{2} - i2\sqrt{2}$ (b) $-2\sqrt{2} + i2\sqrt{2}$ (c) $2\sqrt{2} + i2\sqrt{2}$ (d) none of these

Please turn the page

5) The domain of the function $f(z) = \frac{z}{z+\bar{z}}$ is

- (a) $\text{Im}(z) \neq 0$ (b) $\text{Re}(z) = 0$ (c) $\text{Im}(z) = 0$ (d) none of these

6) For all $z \in \mathbb{C}$ satisfying $\text{Im}(z) \neq 0$, if $f(z) = z^2 + z + 1$ is a real valued function, then its range is

- (a) $(-\infty, -1]$ (b) $(-\infty, \frac{1}{3}]$ (c) $(-\infty, \frac{1}{2}]$ (d) $(-\infty, \frac{3}{4}]$

7) Define $f(z) = z^2 + bz - 1 = 0$ and $g(z) = z^2 + z + b = 0$. If there exists α satisfying

$f(\alpha) = g(\alpha) = 0$, which of the following cannot be a value of b :

- (a) $\sqrt{3}i$ (b) $-\sqrt{3}i$ (c) 0 (d) $\frac{\sqrt{3}}{2}i$

8) The definition of $f(z) = z + \frac{1}{z}$ in polar form is

- (a) $(r + \frac{1}{r}) \cos \theta + i(r - \frac{1}{r}) \sin \theta$ (b) $(r - \frac{1}{r}) \cos \theta + i(r + \frac{1}{r}) \sin \theta$
(c) $(r + \frac{1}{r}) \sin \theta + i(r - \frac{1}{r}) \cos \theta$ (d) $(r + \frac{1}{r}) \sin \theta + i(r + \frac{1}{r}) \cos \theta$

9) $\text{Re}(1 - \cos \theta + 2i \sin \theta)^{-1}$ is equal to

- (a) $\frac{1}{3-5 \cos \theta}$ (b) $\frac{1}{5-3 \cos \theta}$ (c) $\frac{1}{3+5 \cos \theta}$ (d) $\frac{1}{5+3 \cos \theta}$

10) The square roots of $3i$ is equal to

- (a) $\pm \frac{1}{2}(1+i)$ (b) $\pm \sqrt{\frac{3}{2}}(1+i)$ (c) $\pm \frac{\sqrt{3}}{2}(1-i)$ (d) none of these

11) If $\lim_{z \rightarrow 1-i} [x + i(2x+y)] = p + iq$, then $(p, q) = \dots\dots\dots$

- (a) (1, 1) (b) (-1, 1) (c) (1, -1) (d) (-1, -1)

12) $\lim_{z \rightarrow \infty} \frac{iz^2}{(z-1)^2}$ is

- (a) 0 (b) i (c) 1 (d) ∞

Please turn the page

13) $\lim_{z \rightarrow 0} \frac{z}{z}$ is

- (a) -1 (b) \neq (c) 1 (d) 0

14) $\Re(\log(1 + i \tan \alpha))$ is equal to

- (a) $\sec \alpha$ (b) $\tan \alpha$ (c) 0 (d) $\log(\sec \alpha)$

15) $\overline{\cos(iz)} = \cos(i\bar{z})$

- (a) if $z = (2n + 1)\pi$ only (b) if $z = (2n + 1)\pi i$ only
(c) if $z = \left(n + \frac{\pi}{4}\right)$ only (d) for all z

16) $\tanh^{-1} z$ is equal to

- (a) $\frac{1}{2} \log \frac{1+z}{1-z}$ (b) $\log(z + \sqrt{z^2 + 1})$ (c) $\log(z + \sqrt{z^2 - 1})$ (d) $\log \frac{z^2+1}{z^2-1}$

17) The region of z -plane for which $\left| \frac{z-a}{z+a} \right| = 1$, $a \neq 0$ is

- (a) y -axis (b) x -axis (c) The straight line $x = |a|$ (d) none of these

18) Which region is represented by the inequality $|z - 4| < |z - 2|$

- (a) $\Re(z) > 0$ (b) $\Re(z) < 0$ (c) $\Re(z) > 2$ (d) none of these

19) The image of the line $y = a$ under the transformation $w = \cos z$ is

- (a) an ellipse (b) a hyperbola (c) a circle (d) a straight line

20) The image of the real axis under the transformation $w = e^z$ is

- (a) $u = 0$ (b) $v = 0$ (c) $u = e$ (d) $|w| = 1$

21) The function $f(z) = \bar{z}$ is analytic

- (a) everywhere (b) nowhere (c) only at $z = 0$ (d) only at $z = 1$

Please turn the page

22) The function $f(z) = |z|^2$ is

- (a) differentiable and analytic everywhere (b) non differentiable at $z = 0$ but analytic at $z =$
(c) differentiable at $z = 1$ and not analytic at $z = 1$ only
(d) differentiable at $z = 0$ but not analytic at $z = 0$

23) If $f(z) = u(r, \theta) + i \frac{\cos \theta}{r}$ is an analytic function, then $u(r, \theta)$ is equal to

- (a) $r \sin \theta$ (b) $-r \cos \theta$ (c) $-r \sin \theta$ (d) $\frac{\sin \theta}{r}$

24) The harmonic conjugate of $\cos x \cosh y - y$ is

- (a) $\cos x \sinh y + x + c$ (b) $-\sin x \sinh y - x + c$ (c) $\sin x \sinh y - x + c$
(d) $-\sin x \sinh y + x + c$

25) If $e^{ax} \cos y$ is harmonic, then a is equal to

- (a) ± 1 (b) 0 (c) 1 and 2 (d) i and 1

الجزء الثاني: منتصف الترم+الأعمال+الشفوى (50 درجة)

True-False Questions. Classify the following statements as true or false (26-50):

- 26) If $z = -1$, then $\text{Arg}(-z) = \text{Arg}(z) + \pi$. (True - False)
- 27) If $z \in \mathbb{C}$, then $|e^z| \leq 1 \Leftrightarrow \Re(z) \leq 0$. (True - False)
- 28) The imaginary part of $\cosh z$ is $\sinh x \sin y$. (True - False)
- 29) $\text{Log } i^2 = 2 \text{Log } i$. (True - False)
- 30) $|\cos z| \leq 1 \quad \forall z \in \mathbb{C}$. (True - False)
- 31) $\left(\sqrt{2} \cos \frac{\pi}{6} + i\sqrt{2} \sin \frac{\pi}{6}\right)^4 = -2 + i2\sqrt{3}$. (True - False)

Please turn the page

- 32) $z^4 + 1 = \left(z - e^{\frac{\pi}{4}i}\right)\left(z - e^{\frac{3\pi}{4}i}\right)\left(z - e^{\frac{5\pi}{4}i}\right)\left(z - e^{\frac{7\pi}{4}i}\right)$. (True - False)
- 33) If $\sin(x + iy) = u + iv$, then $u^2 \operatorname{cosec}^2 x - v^2 \sec^2 x = 1$. (True - False)
- 34) The function $f(z) = e^{iz}$ is periodic and of period 2π . (True - False)
- 35) The function $f(z) = \cosh z$ is continuous and periodic, of period $2\pi i$. (True - False)
- 36) $w = z^2$ maps the hyperbola $x^2 - y^2 = 4$ to a straight line parallel to the v -axis. (True - False)
- 37) The image of the circle $|z| = 2$ under $w = iz + 1$ is a circle with center $(0, 1)$ and radius 4. (True - False)
- 38) The image of the circle $|z + 2i| = 2$ under $w = \frac{1}{z}$ is a straight line parallel to the u -axis. (True - False)
- 39) The image of y -axis under the transformation $w = e^z$ is a unit circle. (True - False)
- 40) $\lim_{z \rightarrow (-3i)} z^2 e^z = -9 \cos 3 + i9 \sin 3$. (True - False)
- 41) $\lim_{z \rightarrow \infty} \left(\frac{2z^3 + 1}{z^2 + 1}\right) = \infty$. (True - False)
- 42) $\lim_{z \rightarrow i} \frac{z^2 + 1}{z - i} = 0$. (True - False)
- 43) $\lim_{z \rightarrow \pi i} \frac{e^z + 1}{z - \pi i} = i^2$. (True - False)
- 44) The function $f(z) = \sqrt{z}$ is continuous at $z_0 = -1$. (True - False)
- 45) The function $f(z) = \frac{1}{z}$ is uniformly continuous in $|z| < 1$. (True - False)
- 46) The function $f(z) = \sin z$ is uniformly continuous in \mathbb{C} . (True - False)
- 47) $f(z) = \bar{z}$ is continuous everywhere but nowhere differentiable. (True - False)
- 48) If $f(z) = \cos x - i \sinh y, y \neq 0$ then $f'(z) \nexists$ anywhere. (True - False)
- 49) The function $f(z) = \begin{cases} \frac{(\bar{z})^2}{z}, & z \neq 0 \\ 0, & z = 0 \end{cases}$ is differentiable at $z = 0$. (True - False)
- 50) If $z \in \mathbb{C}$, then the sequence (z^n) converges to 0 if and only if $|z| < 1$. (True - False)

Prof. Dr. A. M. Saddeek ... With best wishes ... Signature : Saddeek



Final Exam of Geostatistical Methods
in Geophysics (G456)

Jul. 2021

Time: 2 Hours

(ضع اجابتك في الورقة الاخيره)

Answer the following Questions

The First Question (50 mark)

Answer (T) for true sentences or (F) for false sentences

- 1- Interpolation is used because field data are cheap to collect, and can be collected everywhere.
- 2- A variance value of zero indicates that all values within a set of numbers are identical.
- 3- The main use of geostatistics is to predict values of a sampled variable over the whole area of interest, which is referred to as spatial prediction or spatial interpolation.
- 4- In the random sample, selection of an object does not affect the selection of another object (independence of sampling).
- 5- Theoretical statistics involve the applications of those theorems, formulas, rules and laws to solve real-world problems.
- 6- From types of inferential statistics are measures of central tendency.
- 7- The interpolated surface generated by Minimum Curvature is analogous to a thin, linearly elastic plate passing through each of the data values, with a minimum amount of bending.
- 8- In skewness, a value greater than 0 indicates a peaked distribution and a value less than 0 indicates a flat distribution.
- 9- Regression measures the variability from an average or mean.
- 10- The covariance is the standard deviation divided by the mean.
- 11- Gradual methods produce a smooth surface between sample points.
- 12- Difference between classical statistics and geostatistics is that geostatistics uses the sampling location of every measurement.
- 13- Geostatistics has related to the earth sciences, e.g., hydrogeology, hydrology, meteorology, oceanography, geochemistry, geography, soil sciences, forestry, landscape ecology.
- 14- A variable that cannot assume a numerical value but can be classified into two or more nonnumeric categories is called qualitative variable.
- 15- The Sill is the total vertical scale of the variogram.
- 16- Estimating the value of a point from a set of nearby sample values using Kriging trend.
- 17- Spline method of interpolation estimates unknown values by bending a surface through known values.
- 18- A variance value of zero indicates that all values within a set of numbers are identical.
- 19- Kriging is a part of geostatistics, statistics that treats spatially distributed (and usually continuous) stochastic phenomena.

- 20- Mean , mode and median are single summary measure for one variable.
- 21- Interpolation techniques can be classified into five main classes.
- 22- Zero skewness indicates a distribution with an asymmetric tail extending toward more negative values.
- 23- Correlation coefficient $|r|$ "Absolute value" = zero , the strength is no correlation.
- 24- Negative kurtosis indicates a relatively flat distribution.
- 25- Each object has the same probability of being selected (unbiased sampling technique) in random sample.

The Second Question (Oral and Mid-term exam)

Choose the correct answer (30 marks)

- 1- (Descriptive – Inferential - Theoretical) statistics calculate a few numbers to represent all the data.
- 2- (Member- Sample- variable) is a specific subject or object about which the information is collected.
- 3- A (population- element –member) consists of all elements –individuals, items, or objects whose characteristics are being studied.
- 4- Data collected on different elements at the same point in time or for the same period of time called (time series data – cross section data- Survey)
- 5- Geologic Unit thickness and ground elevation are called (continuous – discrete –qualitative) variables.
- 6- A (variable – sample- member) is a characteristic under study that assumes different values for different elements.
- 7- The technique of collecting information from a portion of the population is called a (sample survey –data set- member).
- 8- In (kurtosis- Skewness – Regression), a value greater than 0 indicates a peaked distribution and a value less than 0 indicates a flat distribution.
- 9- Large data sets for Skewness measure is (unreliable- more reliable - less reliable)
- 10- (Length –Scale - Pairs) is the horizontal range of the variogram.
- 11- A survey that includes every member of population is called (census – data collection - survey)
- 12- A (data set- sample- elements) is a collection of observations on one or more variables.
- 13- A measure of the dispersion of a set of data from its mean called (standard deviation- covariance - kriging)
- 14- (Trend- Variogram – Kriging) is a special application of the concepts of mean and variance to regionalized variables.
- 15- The correlation is between two values of the same variable at times X_i and X_{i+k} called (correlation coefficient –autocorrelation - Regression).



Answer all the following questions

Part I: Activity (10 Marks)

1. What is the difference between **crystalline materials**, **amorphous materials**, and **glasses**?

Part II: Oral exam (10 Marks)

2. State the **preparation methods** of amorphous materials and discuss two of them in detail.

Part III: Midterm exam (30 Marks)

3. Compare the **physical properties** of crystalline and amorphous materials.
4. Draw a **volume/enthalpy diagram** showing the behavior of a melt which cools to form: (i) **glass** and (ii) **crystals**.
Label each section of this diagram and show the curves for rapidly- and slowly cooled melts.
5. why some materials form glasses while others do not?

Part IV: Final exam (50 Marks)

6. Consider these materials: **MgO**, **Al₂O₃**, **SiO₂**
According to **Zachariasens Rules**, which materials can form glasses?
7. What are **chalcogenide glasses**?
8. How many grams of each element is needed to prepare **10 g** from **Ge₆₀Se₄₀** using the **melt-quenching** technique? (Note that the molecular weight of **Ge** and **Se** are **72.61** and **78.96 g/mole**, respectively)
9. What are the advantages of thermal analysis techniques over other analytical methods?
10. What are the principles of Differential Scanning Calorimetry (**DSC**)?
11. Plot the **Lasocka** and **Kissinger** relations using the following data in the **Table** (glass transition temperature (**T_g**) and heating rate (**α**)). From the graphs find the **activation energy of glass transition**, use **R=8.31 J mol⁻¹K⁻¹**

T_g (K)	374.00	376.11	379.01	380.88	383.80
(α) K/min	5	7.5	10	15	20

بسم الله الرحمن الرحيم

جامعة أسيوط

كلية العلوم - قسم الجيولوجيا

امتحان المستوى الرابع بكلية العلوم شعبة الجيولوجيا والكيمياء

المادة: خريطة مصر الجيولوجية (٤١٠ ج)

(Geologic map of Egypt (410-G)

الزمن: ساعتان

الدرجة: ٨٠ درجة

الفصل الدراسي الثاني 2021/2020

الامتحان يتكون من خمس صفحات

(A) Final Examination (50 Marks)

I- Choose the correct answer (16 Marks, one Mark for each one)

- 1- The Cambrian rocks are well represented all over the Egyptian localities. a) True b) False
- 2- The lithology of the different rock units of the Paleozoic rocks in Egypt is very distinctive. a) True b) False
- 3- The southern areas of Egypt are covered by distinctive Jurassic exposures. a) True b) False
- 4- Egypt is characterized by the occurrence of glacial event at the end of Carboniferous Period. a) True b) False
- 5- The relationship between the Paleozoic and Precambrian rocks is nonconformity. a) True b) False
- 6- Ophiolite associations in the Eastern Desert are allochthonous. a) True b) False
- 7- Ophiolites in the Eastern Desert are non-metamorphosed. a) True b) False
- 8- Serpentinities in the Eastern Desert belong to ophiolites. a) True b) False
- 9- Ophiolites generally represent remnants of oceanic crust. a) True b) False
- 10- Boudinaged chromite lenses are associated with meta-gabbros. a) True b) False
- 11- Serpentinities + meta-pyroxenites + meta-gabbros + meta-basalts forms the whole sequence of ophiolite in Egypt. a) True b) False
- 12- The Hammamat rocks are characterized by primary bedding and poorly sorted conglomerates. a) True b) False
- 13- The contact between Fawakhier Younger Granite and Fawakhier Ophiolites is intrusive. a) True b) False
- 14- The Dokhan Volcanics are intrusive bodies. a) True b) False

- 15- The Dokhan Volcanics were characterized by the dominance of andesite and rhyolites volcanics. a) True b) False
- 16- The Dokhan Volcanics built up high-relief outcrops. a) True b) False

II- Choose the correct answer (Multiple Choice Questions, 34 Marks, two Marks for each one)

- 17- Which age covers long time of the earth history?
a) Mesozoic b) Cenozoic c) Paleozoic d) Quaternary
- 18- The GSSP of the Paleocene/Eocene (P/E) boundary was defined by the Paleogene Subcommittee of Stratigraphy in a) Spain b) France c) Egypt d) Brazil
- 19- The Epoch is characterized by volcanic activities.
a) Oligocene b) Pliocene c) Paleocene d) Eocene
- 20- The rock unit (s) is/are of the Eocene age at Fayum region.
a) Qasr El Sagha b) Minia c) Birek Qaroun d) all of these
- 21- Stratigraphically, the Maadi Formation is than/to the Qasr El Sagha Formation.
a) older b) younger c) equivalent d) conformable
- 22- Stratigraphically, the Qarara Formation isthan/to the Rayan Formation.
a) older b) younger c) equivalent d) conformable
- 23- Stratigraphically, the Minia Formation is than/to the Thebes Formation.
a) older b) younger c) equivalent d) conformable
- 24- The age of the Dabaa Formation is
a) Miocene b) Eocene c) Oligocene d) Paleocene
- 25- The age of the Mamura Formation is
a) Miocene b) Eocene c) Oligocene d) Paleocene
- 26- The age of the Shushan Formation is
a) Miocene b) Eocene c) Oligocene d) Paleocene
- 27- Stratigraphically, the Shushan Formation is than/to the Dabaa Formation.
a) older b) younger c) equivalent d) conformable
- 28- Stratigraphically, the Kiseiba Formation is than/to the Dakhla Formation.
a) older b) younger c) equivalent d) conformable
- 29- Stratigraphically, the Tarawan Formation is than/to the Kurkur Formation.
a) older b) younger c) equivalent d) conformable

- 30- Stratigraphically, the Thebes Formation is than/to the Dungul Formation.
a) older b) younger c) equivalent d) conformable
- 31- The stratigraphic arrangement of the Miocene rock units in Red Sea region are
a) Ranga, Um Mahara, Abu Dabab b) Um Mahara, Ranga, Abu Dabab
c) Ranga, Abu Dabab, Um Mahara d) Ranga, Abu Dabab, Um Mahara
- 32- Stratigraphically, the Dakhla Formation is than/to the Duwi Formation.
a) older b) younger c) equivalent d) conformable
- 33- The Paleocene/Eocene (P/E) boundary was marked by climate episode.
a) warm b) temperate c) cool d) glacial

(B) Mid Term, Oral & Activities Examination (30 Marks, two Marks for each one)

- 34- The Rod El Hammal Formation isthan Abu Darag Formation.
a) older b) younger c) equivalent d) none of these
- 35- During which geologic period did the Red Sea Rift take place?
a) Neogene b) Paleogene c) Cretaceous d) Devonian
- 36- Which of the following will not make a fossil?
a) decomposed organic material b) plant impressions (casts)
c) animal footprints d) loose animal bones
- 37- Most periods in the geologic time scale are named for
a) geographic localities b) fossils c) paleontologists d) catastrophic events
- 38- The subsurface Paleozoic rocks were recorded at the part of Egypt.
a) southern b) northern c) eastern d) middle
- 39- Stratigraphically, the Thebes Formation is than/to the Esna Formation.
a) older b) younger c) equivalent d) conformable
- 40- Stratigraphically, the geologic age of the Esna Formation is
a) Eocene-Paleocene b) Cretaceous-Paleocene c) Miocene-Pliocene d) Paleocene-Eocene
- 41- Stratigraphically, the Sudr Formation is than/to the Dakhla Formation.
a) older b) younger c) equivalent d) conformable
- 42- The oldest epoch of the Cenozoic Era is
a) Pliocene b) Paleocene c) Miocene d) Pleistocene
- 43- The group which does not show a correct sequence of the geologic column is:
a) Oligocene, Miocene, Pliocene b) Devonian, Carboniferous, Permian
c) Proterozoic, Mesozoic, Cenozoic d) Triassic, Jurassic, Cretaceous

- 44- The Carboniferous Period was named for the abundant deposits ofthat characterize it.
a) coal b) chalk c) gypsum d) conglomerate
- 45- The Cenozoic does not include the..... age.
a) Ordovician b) Miocene c) Holocene d) Eocene
- 46- The stratigraphic arrangement of the pre-rift rock units are
a) Qusier, Dakhla, Duwi b) Qusier, Duwi, Dakhla
c) Qusier, Duwi, Dakhla d) none of these
- 47- During which the geologic period did Phosphorite Ore form in Egypt?
a) Cretaceous b) Paleocene c) Ordovician d) Carboniferous
- 48- Stratigraphically, the Lakia Formation isthan Qiseib Formation.
a) older b) younger c) equivalent d) none of these

أنتهت الأسئلة مع اطيب الأمنيات بالتوفيق
أ.د/ على عبدالقادر خضير أ.د/ ناجح عبدالرحمن عبيدالله

Assiut University
Faculty of Science
Department of Geology



June, 2021
allowed time:
two hours

Final exam.

Subject: Petroleum Geology and Hydrogeology (G460.), 4th level, special geology, geochemistry and geophysics groups

80 Marks including final, mid-team, oral and activities exams

Answer the following questions

The final exam questions (50 Marks)

I-Answer (T) for true sentences or (F) for false sentences (one mark each).

- 1- Maturation is the process that is carried out at shallow depths and from which the gas and oil are generated.
- 2- API is proportion reversely with viscosity and specific gravity of oil.
- 3- Critical moment in petroleum system is the time through which the petroleum is accumulated .
- 4- Crude oil is the mixture of hydrocarbon that is liquid in the underground reservoir and at the normal atmospheric temperature when extracted to the surface
- 5- The gross pay is the drilled thickness of the petroleum reservoir.
- 6- Petroleum pool is one lenticular petroleum reservoir
- 7- Kerogen types are classified based on kinds of organic matters.
- 8- Secondary migration of hydrocarbons is carried out in reservoir rocks.
- 9- For hydrocarbon generation and accumulation source rocks, migration routes, reservoir rocks, trap and seal rocks must be present.
- 10- Hydrocarbon trap is the geologic feature in which the petroleum is generated.
- 11- Petroleum system includes four elements and five processes.
- 12- Lateral and vertical continuity indices of hydrocarbon reservoir are mainly controlled by structure, stratigraphic and diagenetic features.
- 13- The source rocks in Gulf of Suez oil field are Nubian group which belonging to Paleocene and Abu Quda formation which belonging to Cenomanian age.
- 14- Juvenile type of water is water that was entrapped in the interstices of a sedimentary rock at the time of the rock was deposited.
- 15- Groundwater is a significant part of the hydrologic cycle, containing 21 percent of Earth's freshwater.
- 16- Aquifer is a formation or group of saturated geologic formations capable of storing and yielding freshwater in usable quantities.
- 17- According to water storage and transmission properties, geological formations can be classified into four hydrogeological units as aquifers, aquitards, aquicludes, and aquifuges.
- 18- The specific yield of an aquifer is always more than the porosity.

- 19- The hydraulic conductivity is equal to the specific discharge under unit hydraulic gradient.
- 20- The rate at which groundwater moves through the saturated zone depends on the permeability of the rock and the hydraulic gradient.
- 21- In any evaluation of groundwater resources the quality of the water is of almost not equal importance to the quantity available.
- 22- Drinking water should be aesthetically acceptable in that it should not possess unpleasant or objectionable taste, odor, color or turbidity.
- 23- Permeability is a measure of how well the spaces are disconnected.
- 24- Tastes and odors of groundwater may be derived from the presence of mineral matter, organic matter, bacteria or dissolved gases.
- 25- In an unconfined aquifer the groundwater table forms the lower boundary of the saturation zone.

II- Choose the correct answer A, B or C of the following (one mark each)

- 26- Vitritinite kerogen which originated from fibrous and woody plants as well as fragment and structureless colloidal humic matters generally produces: -
 - a- Oil at depth level 2.5-4km. and high temperature
 - b- Gas at depth level 4-5km and low temperature
 - c- Gas at depth level 4-5km and high temperature
- 27- Sour oil is
 - a- Free from sulfur
 - b- Generated at great depths
 - c- Less quality in compared with sweet oil
- 28- Sweet oil is
 - a- Free from sulfur
 - b- Generated at shallow depths
 - c- Less quality in compared with sour oil
- 29- API is the unit that differentiate between
 - a- Light and heavy oil
 - b- Oil and gas
 - c- Thermal and biogenic gases.
- 30- Rate of maturation is depending on: -
 - a- Time and pressure
 - b- Temperature & time and possibly pressure
 - c- Temperature and pressure
- 31- At catagenesis zone of petroleum generation, if the kerogen from type I, the produced hydrocarbon is mainly: -
 - a- Gas
 - b- Oil
 - c- Immature hydrocarbons
- 32- Secondary migration phase which depending on specific gravity of the hydrocarbons is generally carried out in :-
 - a- Reservoir rocks
 - b- Source rocks

- c- Migration root
- 33- Most of hydrocarbon occurrences all over the world are generally in:-
 - a- Regions of high tectonic and sedimentation
 - b- Regions of high tectonic and low sedimentation
 - c- Regions of low tectonic and high sedimentation
- 34- Petroleum quality is measured by API%, The Egyptian petroleum especially that occurred in Western Desert region has:-
 - a- High API %
 - b- Low API%
 - c- Moderate API%
- 35- The amount of hydrocarbon generation depends on:-
 - a- Amount of the organic matter in oxidizing conditions
 - b- Amount of organic matter in reduction conditions
 - c- Presence of capillary pressure
- 36- Hydrodynamic traps are generally accompanied with: -
 - a- Rechargeable groundwater aquifer with water flow toward the crest of anticline fold
 - b- Highly structures regions with water flow toward
 - c- Thick impermeable sedimentary rocks with water flow
- 37- Traps that associated with syn-rift are mainly
 - a- Stratigraphic traps
 - b- Structure traps
 - c- Hydrodynamic traps
- 38- Precipitation exceeds evaporation over:
 - a. Continents.
 - b. Oceans.
 - c. Rivers.
- 39. Hydrologic Cycle Powered by energy from the:
 - a. Earth.
 - b. Moon.
 - c. Sun.
- 40. Excessive rain or snowmelt can produce overland flow process called:
 - a. precipitation.
 - b. evaporation.
 - c. runoff.
- 41. Water vapor raises cools and eventually:
 - a. percolate.
 - b. condenses
 - c. evaporate.
- 42. Recharge to water table (downward flow):
 - a. 50% of infiltration in clay deposits.
 - b. 0% of infiltration in clay deposits.
 - c. 10% of infiltration in clay deposits.
- 43. Groundwater makes up about:
 - a. 80% of the water on the Earth.
 - b. 20% of the water on the Earth.

- c. 1% of the water on the Earth.
- 44. Most groundwater is derived from the atmosphere in the form of rainfall, snow, hail, etc.
 - a. Water of this type is referred to as connate water.
 - b. Water of this type is referred to as meteoric water.
 - c. Water of this type is referred to as juvenile water.
- 45. The uppermost layer, which is necessary for plant life:
 - a. is the capillary fringe zone.
 - b. is the soil moisture zone.
 - c. is the intermediate zone.
- 46. The amount of spaces in the rock is called:
 - a. Permeability.
 - b. Porosity.
 - c. Conductivity
- 47. According to water storage and transmission properties, geological formations can be classified into:
 - a. Ten hydrogeological units
 - b. Four hydrogeological units
 - c. Five hydrogeological units
- 48. A geological formation with non-interconnected openings or interstices is called the:
 - a. aquicludes
 - b. aquifuges
 - c. aquitards
- 49- the specific yield is known as:
 - a. the porosity.
 - b. the effective porosity.
 - c. the non-effective porosity.
- 50. Water leaving an aquifer is called:
 - a. seepage.
 - b. recharge.
 - c. discharge.

The mid-team questions (10Marks)

I-Answer (T) for true sentences or (F) for false sentences (one mark each).

- 51- Stratigraphic traps which unassociated with unconformities are belonging to structures.
- 52- Structure traps are predominant in Nile Delta gas and oil fields.
- 53- Water drive production is the best method for producing from hydrodynamic traps.
- 54- Hydrogeology is an interdisciplinary subject.
- 55- The study of the interaction between groundwater movement and geology can be quite simple.

II. Choose the correct answer A, B or C of the following (one mark each)

- 56- Capillary pressure in the reservoir is generally increases with:-
a- Increasing of pore size of the reservoir rocks
b- Decreasing of the pore size of the reservoir rock
c- Increasing of hydrocarbon contents
- 57- At Metagenesis zone of petroleum generation, the produced hydrocarbon is mainly: -
a- Gas
b- Oil
c- Immature hydrocarbons
58. The hydrologic cycle is the process:
a. by which water travels from the atmosphere to the Earth's surface and then back to the atmosphere.
b. by which water travels from the Earth's surface to atmosphere and then back to the ground again.
c. by which water travels from beneath the Earth's surface to atmosphere and then back to the ground again.
59. Evaporation exceeds precipitation over:
a. continents.
b. oceans.
c. rivers.
60. Hydrogeology is a part of:
a. geology
b. hydrology
c. groundwater

The oral questions (10 Marks)

I- Answer (T) for true sentences or (F) for false sentences (one mark each).

- 61- Stratigraphic traps are more predominant than structure traps in Gulf of Suez oil field.
- 62- Source rocks are porous and permeable.
- 63- Confined aquifer bounded by confining beds.
- 64- The dissolution of rock-forming minerals commonly is brought about by acid attack.
- 65- Water vapor emitted from rivers by a process called transpiration.

II- Choose the correct answer A, B or C of the following (one mark each)

- 66- Diagenesis is a process that can lead to barrier in petroleum reservoirs, if it from cementation type, it :-
a- Increases the LCI of the reservoir
b- Decreases the LCL of the reservoir
c- Has no effect on the reservoir continuity
- 67- Post-discovery volumetric reserve calculation of hydrocarbons is estimated from:-
a- Surface geophysical results
b- Borehole geophysical results

- c- Surface geochemical results
- 68- Preliminary exploration of large sedimentary basins which may contain hydrocarbons is generally carried out by applying:-
 - a- Seismic methods
 - b- Gravity and/or magnetic methods
 - c- Electric methods
- 69. The hydrologic cycle is the process:
 - a. by which water travels from the atmosphere to the Earth's surface and then back to the atmosphere.
 - b. by which water travels from the Earth's surface to atmosphere and then back to the ground again.
 - c. by which water travels from beneath the Earth's surface to atmosphere and then back to the ground again.
- 70- Evaporation exceeds precipitation over:
 - a. continents.
 - b. oceans.
 - c. rivers.

The activities questions (10 Marks)

I. Answer (T) for true sentences or (F) for false sentences (one mark each)

- 71. The clastic reservoir rocks in the Western Desert are the Nubian sandstone members that belonging to Paleozoic and Bahariya, Abu Roash, Khuman chalk formations which belonging to Lower and Upper Cretaceous.
- 72. Net pay is the total thickness of the petroleum reservoir.
- 73. Groundwater is water that exists in the pore spaces and fractures in rock and sediment above the Earth's surface.
- 74. Water vapor emitted from rivers by a process called evaporation.
- 75. Connate type of water is water derived from igneous processes within the depths of the earth.

II. Choose the correct answer A, B or C of the following (one mark each)

- 76. Water is a common:
 - a. organic substance
 - b. chemical substance
 - c. physical substance.
- 77- Water for most domestic and industrial uses should contain less than:
 - a. 1000 mg/l
 - b. 100 mg/l
 - c. 10 mg/l
- 78. Saltwater oceans hold:
 - a. 55% of surface water.
 - b. 80% of surface water.
 - c. 97% of surface water.
- 79. Traps that associated with post-rift are mainly:-
 - a- Structure traps
 - b- Combined traps

c- Diapiric traps

80. Permeability of reservoir rocks has direct effect in:-

- a- Reservoir productivity
- b- Reservoir continuity
- c- Trapping of hydrocarbons

+++++

GOOD LUCK