



Final Exam in General Geology (G100)

Duration: 2 Hours

March, 2021

(Total Marks: 50)

- Select the letter (A, B or C) of the choice that BEST answers the question. Each question has ONLY one correct answer.

- [illegible]

16- The luster of quartz mineral is

- a- adamantine b- vitreous c- silky

17- The mafic igneous rocks contain about % silica.

- a- 20 b- 50 c- 80

18- Which of these rocks is not an intrusive igneous rock?

- a- gabbro b- basalt c- granite

19- are types of sedimentary rocks.

- a- Clastic sedimentary rocks b- Organic sedimentary rocks c- both of them

20- The sedimentary rock made of CaCO_3 composition is called

- a- coal b- quartzite c- limestone

21- Limestone recrystallized during metamorphism to

- a- schist b- marble c- quartzite

22- Gneiss rocks are a result of

- a- regional metamorphism b- thermal metamorphism c- dynamic metamorphism

23- is one of the types of metamorphism.

- a- Regional metamorphism b- Thermal metamorphism c- both of them

24- Slate rocks are results of

- a- regional metamorphism b- thermal metamorphism c- dynamic metamorphism

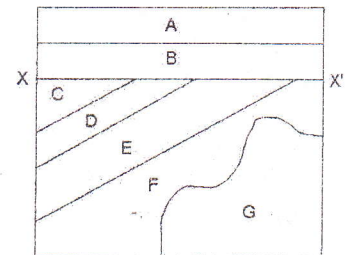
25- is the agent of thermal metamorphism.

- a- Pressure b- Temperature c- both of them

26- Units A, B, C, D, E, and F are sedimentary rocks. Unit G is granite.

Which of the following statements is true?

- a- Deposition of unit A occurred before deposition of unit B
b- Erosion took place before the deposition of unit B
c- Unit C is younger than unit A



27- A thrust fault is different from a reverse fault because

- a- it is higher-angle, and is the structure that transports its hanging wall block only a few meters
b- it is lower-angle, and is the structure that transports its hanging wall block many kilometers
c- it is sometimes a normal fault if it is at an angle of about 45 degrees

28- Which of the following is NOT true about "dip-slip" faults?

- a- they are folded layers of rocks
b- they are "normal" or "reverse"
c- they have motion in the plane of the fault

29. A syncline is

- a- Upfolded or arched rock layers
b- Downfolds or rock troughs
c- Large, step-like folds in otherwise horizontal sedimentary strata

30-A mechanical weathering process caused by pressure release or unloading is

- a- salt wedging B- hydrolysis C- exfoliation

31- How does weathering differ from erosion?

- a- Weathering requires the presence of moisture; erosion requires moving water.
- b - Weathering is an external process; erosion is an internal one.
- c- Weathering is the breakdown of material; erosion is the removal of the weathered material.

32- Hydrolysis is a chemical reaction in chemical weathering; it is responsible for:

- a- The Oxidation of the elements iron and copper
- b- The conversion of feldspars, the most common minerals in the earth's crust, to clay
- c- The addition of water to the mineral anhydrite

33- Burrowing animals and some insects loosen and break apart the rocks, this called:

- a- Dissolution
- b- Weathering
- c- Erosion

34-When carbonate laden water reaches the air of a limestone cave, it loses some of its dissolved CO₂ and calcite precipitates to form limestone deposits called ..?..

- a- loess
- b- calcite
- c- stalactite and stalagmite

35. Desert pavement is:

- a- A salty crust in the desert
- b- A layer of coarse rocks and pebbles left behind by deflation
- c- An alluvial fan

36- Which one of the following statements is FALSE?

- a- Sand dunes are the most common desert landform.
- b- Deserts are not dominated by rock falls and rock slides.
- c- In deserts, the process in which wind picks up sediment is called deflation.

37- A stream in its mature stage has

- a- a moderate gradient and velocity
- b- a steep gradient and high velocity
- c- a very low gradient and velocity

38-When a steep mountain stream enters a flat valley; sediments transported in the stream become deposited. These deposits are called?

- a- biogenic weathering
- b- alluvial fans
- c- turbidites

39- Permeability is:

- a- The process by which plants release water vapor to the atmosphere.
- b- The amount of water vapor in the air relative to the maximum amount of water vapor that air can hold.
- c- The percentage of pore space in the rock.

40- The boundary between the saturated zone and the unsaturated zone is called the:

- a- water table
- b- Aquifer
- c- Aquiclude

41- is a natural underground opening with a connection to Earth's surface.

- a- Cave
- b- Sinkhole
- c- Sinking stream

42- is a place where water flows naturally from rock onto the land surface.

- a- Well
- b- Perched water table
- c- Spring

43- Which one of the following statements is FALSE?

A fossil may be:

- a- an original skeleton or shell;
- b- material that has replaced the once living thing;
- c- an original body found in the present time

44- Which one of the following statements is True?

One of the conditions promote fossilization is

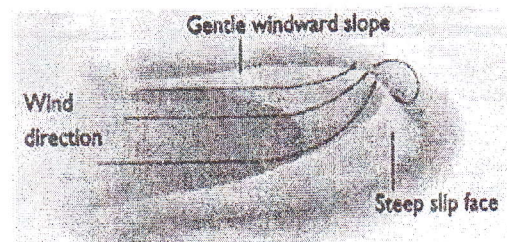
- a- Rapid burial and/or lack of oxygen
- b- Presence of soft body parts
- c- material is trapped inside coating such as water

45- A fossil mold is

- a- a reproduction of the inside or outside surface of a living thing
- b- duplicate of the original organism; usually formed by replacement of inside of living thing
- c- Spaces dug out by living things and preserved as is or filled in

46- This type of sand dune is a Barchan Dune

- a- True
- b- False



47- Along the inner parts of the meanders, the water is characterized by high velocities and erosion.

- a- True
- b- False

48- The primary structures are the features of rocks that are present after the onset of deformation.

- a- True
- b- False

49- Aquicludes are porous and permeable strata that store and transmit water freely.

Typically well-sorted, fractured rocks or partially dissolved carbonates.

- a- True
- b- False

50- In fossils, carbonization of tissue material is the decomposed or reduced to a film of CO_2 .

- a- True
- b- False

GOOD LUCK انتهى الأسئلة

Oral Exam (10 marks)

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

- 51- The average density of the Earth's core is
a- 11 g/cm³ b- 10 g/cm³ c- 9 g/cm³
- 52- The composition of rhyolite rocks are
a- feldspar and quartz b- plagioclase and pyroxene c- plagioclase and olivine
- 53- Mylonite is a result of metamorphism
a- thermal b- dynamic c- regional
- 54- system has three axes are equal in the length.
a- Orthorhombic b- Tetragonal c- Cubic
- 55- Oceanic and continental crust is different in the
a- composition b- thickness c- both of them
- 56- A disconformity is:
a- an erosional surface between igneous and metamorphic rocks
b- an erosional surface between horizontal layers of sedimentary rocks
c- a rock unit that is different than units above or below it
- 57- Mechanical weathering can result from the action of all of the following EXCEPT:
a- Ice wedging b- Action of Carbonic acid c- Plant roots
- 58- Braided channels are found
a- In streams having highly variable discharge and easily eroded banks
b- When the erosion on the outside meander bends continuous to take place
c- In streams having low variable discharge and resistant eroded banks
- 59- An Example of unaltered fossils is:
a- fossils that preserved by Permineralization
b- organisms that have been preserved in amber
c- fossils that preserved by replacement
- 60- The formation of gypsum from anhydrite is a good example of.....
a- Oxidation b- Hydrolysis c- Hydration

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انتهت الأسئلة

**Second Level Examination in****Geomorphology and Environmental Geology (201G)****Time: Two Hours****(Total Marks 50)****28-Feb. , 2021**

Select the letter (a, b, or c) of the choice that BEST answers the question. Each question has **ONLY** one correct answer. (One mark for each question)

1. An antecedent river valley

- a. is older than the geological structure through which it carves its route.
- b. has a superimposed drainage system.
- c. had to carve into the underlying structure because the river valley was too deeply carved.

2. Base level is:

- a. the level associated with the base of a river channel
- b. the level above which flood waters will not rise
- c. the level below which streams will not erode

3. A drainage basin is

- a- The length of a large river.
- b- A lake or ocean into which a river drains.
- c- The total area drained by a stream and its tributaries.

4. What is a watershed?

- a. It's a water bed.
- b. It collects precipitation, which coalesces to form rivers.
- c. None of the above

5. The boundary of a watershed is defined by

- a- the largest order of the main stream.
- b- a continental divide.
- c- the number of tributaries in a basin.
- d- none of the above.

6. Which of the following is not a drainage pattern?

- a. dendritic
- b. trellis
- c. all of these describe drainage patterns

7. Dendritic stream pattern will tend to develop in
- a. regions underlain by regularly-spaced joints or faults
 - b. regions of folded strata
 - c. regions of flay-lying sedimentary rocks
8. What type of drainage pattern would you expect to find on a volcano?
- a. Dendritic
 - b. Rectangular
 - c. Radial
9. What type of drainage pattern would you expect to find where rapid weathering along joints in bedrock controls the course of streams?
- a. Dendritic
 - b. Rectangular
 - c. Radial
10. Potholes in river bottom bedrock are formed by.
- a. the impact of a large rock moved by a strong current which makes a "crater"
 - b. the grinding action of a pebble or cobble in a swirling eddy
 - c. cascading water from a waterfall which wears away the rock
11. What type of a slope is the scarp slope of a cuesta?
- a. Dip
 - b. Steep
 - c. gentle
12. A homoclinal ridge that is angled beyond 30° is known as a:
- a. cuesta
 - b. hogback
 - c. butte
13. The process of a mesa becoming a butte is as a result of:
- a. cutting
 - b. Down soil creep
 - c. scarp recession
14. What does uniformitarianism state
- a. The physical processes that we see operating today most likely operated in the same fashion in the past, and the landforms we see today are a result of gradual cumulative change.
 - b. The landforms we see today are the result of several global catastrophes that occurred during Earth's past.
 - c. The landforms we see today precipitated from the waters of a past global flood.
- 15- Meteor is
- a. icy body spends most of its time in the outer Solar System
 - b. solar radiation heats the *meteor* 's surface, causing part of the ice to boil off into space
 - c. a glowing trail of hot gas and vaporized debris left by a solid object heated by friction as it moves through the Earth's atmosphere

16. The early Earth was very different from what is today in.

- a. It was having a huge ocean larger than the modern oceans
- b. It was having a surface, probably more closely resembling the barren, cratered surface of the moon.
- c. Dense materials, like metallic iron, tended to sink toward the surface of the earth.

17. The planets formed nearest to the sun contained mainly

- a. High-temperature materials; metallic iron and a few minerals with very high melting temperatures, with little water or gas.
- b. Low-temperature minerals, including some that contain water locked within their crystal structures.
- c. Nearly all of the materials are still condensed materials like methane and ammonia

18. The Banded iron ore was formed during

- a. Precambrian
- b. Cambrian
- c. Mesozoic

19. Topple-is

- a. free vertical drop of material from a cliff or steep slope.
- b. a block turning round
- c. mass sliding along well-defined failure surface

20. Creep is the slow downhill movement of material that:

- a. decrease of slope can increase creep rate;
- b. decrease of vegetation can increase creep rate;
- c. decrease of moisture content can increase creep rate;

21. Slurry flow can divide to

- a. mud flow and debris flow
- b. earth flow and granular flow
- c. debris flow, mud flow and solifluction

22. In the isolated system; the boundaries are such that

- a. they prevent the system from exchanging either matter or energy with its surroundings.
- b. it is impossible for any boundary to be so perfectly protecting that energy can neither enter nor escape.
- c. make a system is imaginary only

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

- a. Eutrophication
- b. Aerobic environment
- c. Acidification

24. When the growth of plankton and algae is uncontrolled, a situation called

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

25. Acid mine drainage can cause acidification of

- a. Surface water bodies b. Groundwater c. Both

26. Volcanic ash, cinders, and bombs are examples of material.

- a. plutonic b. metamorphic c. pyroclastic

27. Crater Lake contains a collapse volcanic feature known as a

- a. caldera b. shield volcano c. flood basalt
d. big hole in the ground e. none of the above

28. Active volcano is

- a. volcano with no historic record however show evidence of geologically recent activity
b. volcano with no historic record and no evidence of geologically recent activity
c. volcano observed in eruption during historic time

29. Which magma of the following rocks is more viscous?

- a. Rhyolitic/Granitic magma b. Andesitic/intermediate magma c. basaltic magma

30. When the temperature of water rises, the amount of dissolved oxygen

- a. Decreases b. increases c. unchanged

31. As a result of weathering,

- a. The Earth's lithosphere is broken up into a series of enormous rocky plates.
b. The Earth has cooled off more slowly than the others
c. The Earth is covered by an irregular blanket of loose rock debris, or regolith.

32. Effluents that cause the depletion of dissolved oxygen in a water body are said to

- a. a biochemical oxygen demand (BOD)
b. aerobic environment c. sewage

33. The oceans contain 38,000 billion tons of carbon, most of it in the form of

- a. hard CaCO_3 called limestone
b. dissolved carbon dioxide
c. chemical compounds called *clathrates*

34. One of the factors that can cause slope failure is

- a. vegetation adding b. Undercutting c. Low steep slopes

35. The base level is the lowest level to which a stream can erode.

- a. (True) b. (False)

36. Developments of geomorphic features are affected by the exogenic processes only:

- a. (True) b. (False)

37. Valley developed vertically by the action of Pothole drilling along the valley floor.

- a. (True) b. (False)

38. The cross profile of a valley is generally symmetrical.
a. (True) b. (False)
39. Deltas form when a stream or river flows into a quiet body of water.
a. (True) b. (False)
40. Scarps are generally the common topographic expression of faults.
a. (True) b. (False)
41. Poor correlation between rock resistance and topographic forms among the features
Diagnostic of Fault- line Scarps.
a. (True) b. (False)
42. Inversion of topography means structurally high and topographically low only.
a. (True) b. (False)
43. Gently sloping land that extends out from base of mountains is called Piedmont.
a. (True) b. (False)
44. Pile of loose sand accumulated by winds lead to development of the Sand dunes.
a. (True) b. (False)
45. Sinkholes are the only topographic forms in the karst terrain
a. (True) b. (False)
- 46- Slope Remediation Techniques include; Bio-Engineering, Siphon Drains and Reinforced
Walls
a. (True) b. (False)
- 47- The Earth's early atmosphere was probably much more oxidizing (i.e., oxygen-rich) than the
present atmosphere
b. (True) b. (False)
- 48- As a result of weathering, the Earth is covered by an irregular blanket of loose rock debris
called regolith, though other planets and planetary bodies with rocky surfaces have no regolith.
a. (True) b. (False)
- 49- Plate tectonic activity is responsible for the creation of mountains, volcanoes, and deep ocean
basins, and has influenced the formation of the atmosphere
a. (True) b. (False)
- 50- When water contaminated with sewage passes through sand or permeable sandstone, it
remains polluted.
a. (True) b. (False)

GOOD LUCK

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10-Jan. - 2021

Assiut University Faculty of Science Geology Department		جامعة أسيوط كلية العلوم قسم الجيولوجيا
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**First Semester Final Examination
Zoology Students
(Paleontology)**

March 2021	G211	50 Marks	Time: 2 hours
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Answer the following questions

First question

Choose the correct answer (25 mark, one mark for each)

1. Extinct marine organisms show some similarity to crustaceans and appeared in the fossil record during the Early Cambrian period known as.....
 - a. Conodonts
 - b. Diatoms
 - c. Trilobites
 - d. Ostracods
2. The marine microfossils gained its importance due to their.....
 - a. minute size
 - b. abundant occurrence
 - c. wide geographic distribution
 - d. all of them
3. Foraminifera is belonging to Kingdom.....
 - a. Protista
 - b. Animalia
 - c. Sarcodina
 - d. Vertebrate
4. Type of fossils that used to establish the age of rock layers due to their short range of geologic time known as.....
 - a. Pseudo fossils
 - b. Index fossils
 - c. Trace fossils
 - d. Body fossils
5. Salinity as a chemical factor has a direct effect on.....of the foraminifera shell
 - a. Shape
 - b. Size
 - c. Coiling
 - d. Length
6. Group of organisms that are restricted in occurrence to the photic zone.....
 - a. Bivalvia
 - b. Foraminifera
 - c. Coccolithophores
 - d. Trilobites
7. The foraminifera wall structure ismorphological features.
 - a. Changeable
 - b. Unchangeable
 - c. Semi-changeable
 - d. None of them
8. can be used as a palaeosalinity indicator.
 - a. Conodonts
 - b. Ostracods
 - c. Gastropoda
 - d. Brachiopoda
9. Processes of fossilization that takes place when water dissolve the original hard parts and replaces them with mineral known as.....
 - a. Replacement
 - b. Carbonization
 - c. Lost of originals
 - d. Permineralization
10. The totality of fossils in rock formations and sedimentary layers known as.....
 - a. Fossil Record
 - b. Geologic time
 - c. Bioherm
 - d. Biostrom
11. During theboundary, trilobites reached their acme.
 - a. Paleocene/Eocene
 - b. Cretaceous/Paleogene
 - c. Triassic/Jurassic
 - d. Cambrian/Ordovician

12. *Fusulina* foraminifera is largely known as rock forming fossil during.....Era
 a. Mesozoic b. Cenozoic c. Paleozoic d. Paleocene
13. could be used to detect the effects of human pollution on lakes.
 a. Foraminifera b. Diatoms c. Cephalopods d. Brachiopods
14. Foraminifera reach its maximum abundance during.....
 a. Upper Cretaceous b. Eocene c. Lower Cretaceous d. Paleocene
15. When Conodont alteration index has brown to dark brown color indicates temperature..
 a. 190-300 °C b. 60-140 °C c. 110-200 °C d. <50-80 °C
16. One of the following microorganism has an organic skeleton.....
 a. Ostracods b. Graptolites c. Diatoms d. Brachiopods
17. Echinoidea is divided into 2 orders according to their.....
 a. Symmetry b. Corona c. Apical system d. Mode of life
18.can be used as a geo-thermometer indicator.
 a. Conodonts b. Ostracods c. Gastropods d. Brachiopods
19. Conodont which has thin bars with multiple denticles in a row known as.....
 a. Simple cone b. Platform c. Blade-type d. Bar-type
20. Discoasters first appeared in theEpoch.
 a. Cretaceous b. Miocene c. Eocene d. Paleocene
21. Group of microorganism that has a skeleton made up of silica.....
 a. Foraminifera b. Diatoms c. Ostracods d. Graptolites
22. Phylum Echinodermata is classified into two subphylum according to their.....
 a. Mode of life b. Symmetry c. Skeleton structure d. All of them
23. is the line where the posterior margin of Brachiopods valves meets.
 a. Hinge line b. Commissure line c. Pallial line d. Moho line
24. Depth as a physical factor has a direct relation to the distribution of.....Foraminifera
 a. Planktonic b. Benthonic c. None of them d. A and B
25. The surface water paleotemperature can be detected by using.....
 a. Calcareous nannofossils b. Planktonic foraminifera c. Trilobites d. None of them

Second question

Put true (✓) or false (x) in the front of the following sentences (25 mark, one mark for each)

26. Discoasters have become extinct at the close of the Pliocene Epoch..... ()
27. Cephalopods Nuttallitic suture line has a geologic range from Devonian to Permian ()
28. The geographic bias considers one of the advantages of fossil record..... ()
29. Ostracods ornamentation doesn't reflect the nature of its living environment..... ()

30. Brachiopods which have valves that lack to teeth and sockets are called inarticulate.... ()
31. The Ammonoids are classified based on the serrations in the suture lines..... ()
32. Crinoids calyx that has radial, basal and infra-basal plates is called three-cyclic calyx ()
33. The increased abundance of the shell-crushing predation participates effectively in the declining number of Brachiopod species ()
34. Conodonts are extinct early vertebrate that range from Cambrian to Triassic..... ()
35. The most geologic important subclass of Cephalopods is Ectocochlia..... ()
36. Gastropods are characterized by benthonic epifaunal mode of live and preferred deep marine environments..... ()
37. Bivalve is usually found in the shallow marine fresh and brackish water environment.. ()
38. Graptolites are considered as one of the pseudo-planktonic marine microorganisms.... ()
39. Ostracod outer shelf fauna are marked by containing Amphidont hinge line..... ()
40. Coccolithophores consider on of the major source of the atmospheric oxygen..... ()
41. Calcareous nannoplankton are able to live below the calcium carbonate compensation depth..... ()
42. Dendritic Graptolites are usually found until the Triassic period..... ()
43. The Porcelaneous foraminifera wall structure is characterized by the presence of the calcite crystals arranged along the C axis..... ()
44. Most of the organisms with hard shells have a chance to go to the fossilization processes..... ()
45. Bivalve that have a dental plate composed of very large teeth lie on the both sides of the ligament pit known as isodont dentation..... ()
46. The megalospheric form of foraminifera contains many chambers as well as large first chamber..... ()
47. Platform conodonts has a geologic range from Ordovician to Triassic so it can be considered as an index fossil..... ()
48. Trace fossils are useful tool for studying the behavior of ancient organisms..... ()
49. Trilobites are usually more abundant on the continental shelf..... ()
50. Graptolites are classified on the basis of their mode of life..... ()

Oral Examination (10 marks)

Choose the correct answer:

51. are marine-colonial animals.

- a. Conodonts b. Graptolites c. Gastropoda d. Brachiopoda

52. During Oysters are formed banks reaching more than 5 meters in height.

- a. Triassic b. Jurassic c. Paleocene d. Cretaceous

53. Ostracod inner shelf fauna are characterized by hinge line.

- a. Adont b. Merodont c. Amphidont d. All of them

54. The individual calcareous nannoplankton single disc-like plate known as

- a. Coccolithophore b. Coccolith c. Coccosphere d. Heterococcoliths

55. Group of organism that have the oldest living hard shell known as

- a. Brachiopoda b. Trilobites c. Gastropoda d. Foraminifera

Put true (✓) or false (x) in the front of the following sentences:

56. The fossil record is incomplete due to destruction of the organic remains..... ()

57. Cephalopods ceratitic suture line is restricted to Triassic age..... ()

58. Ostracoda are marked by an unequal valves size..... ()

59. Coccolithophore and Diatoms are found to be more abundant in upwelling zones... ()

60. Oysters are characterized by having one muscle, absence of teeth and sockets..... ()

Good Luck

Dr. Amr Abdel Sabour

جامعة اسبوط – كلية الهندسة

امتحان نهاية الفصل الدراسي

مساحة مستويه (٢٠٠ هـ)

الزمن ٢.٠ ساعة

يناير ٢٠٢١

قسم جيولوجيا – كلية العلوم

السؤال الاول: (٢٠ درجة)

- ١- توجد عدة طرق لرفع التفاصيل لغرض انشاء خريطة مساحية. وضح طريقة القياسات الطولية لرفع التفاصيل مع ذكر مصادر الاخطاء فيها
- ٢- ارسم مقياس رسم ١:١٠٠٠ ليبين ٠.٥ متر وحدد عليه القراءة ٢٥.٥ متر
- ٣- بين الخرائط المجاورة للخريطة الطبوغرافية مقياس ١:٢٥٠٠٠ والتي رقمها هو $\frac{83}{315}$

السؤال الثاني: (٤٠ درجة)

- ١- اذكر باختصار مميزات وعيوب البوصلة المنشورية عند استخدامها في الارصاد المساحية
- ٢- صحح بطريقة المتوسطات الانحرافات الامامية والخلفية للمضلع ABCDE اذا كانت القراءات المرصودة كما يلي:

الضلع	الطول	الانحراف الامامي	الانحراف الخلفي
AB	٧٠.٠	62° 05'	242° 04'
BC	٥٨.٠	145 44	326 44
CD	٤٣.٠	190 30	11 30
DE	٦٢.٠	246 58	66 34
EA	٧٩.٠	323 45	143 15

السؤال الثالث: (٤٠ درجة)

- ١- اذكر باختصار انواع الميزانية واهميتها في الاعمال الهندسية
 - ٢- عند انشاء طريق جديد تم عمل ميزانية طولية على طول محوره وكانت قراءات القامه كما يلي:
٢.١٩, ١.٩٨, ٢.٠١, ٢.١٥, ٢.٢٠, ٢.١٠, ٢.٠٢, ١.٩٥, ١.٩٥, ٢.٠٥, ١.٨٢, ١.٨٠, ١.٨٧, ١.٩٠
- احسب بطريقة سطح الميزان مناسيب الارض المرصودة اذا كانت النقطة الثالثة نقطة دوران والقراءتان السابعة والتاسعه مقدمتان مع العلم ان القراءة الاولى هي ٢.١٩ م. ارسم القطاع الطولي بمقياس مناسب اذا كانت المسافات البينية بين النقاط متساوية وتساوى ٥٠ متر.

د محمد هاشم عبد العال

نهاية الاسئلة مع تمنياتي بالتوفيق

Assiut University
Faculty of Science
Department of Geology



Date: March 2021
Time allowed: 2 hours

Final Exam
Principles of Geophysics (G 250), Total of 50 Marks
(use the bubble sheet for your answers)

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A) Mark the following statements with True (✓) or False (X): (25 marks, one marks each)

No	Statement	TRUE (✓)	FALSE (X)
1	Secondary seismic waves can travel through liquids		
2	Geophysics does not replace traditional geologic study; it compliments it		
3	Primary seismic waves are slower than secondary seismic waves		
4	Electrolytic conduction is faster than electronic conduction and occurs in fluids		
5	The higher the value of the modulus, the stronger the material, and the smaller the strain produced by a given stress		
6	With increasing water content, the electrical resistivity of earth materials increases		
7	Seismic wave is defined as the transfer of energy by way of particle motion		
8	Resistivity increases with increasing metallic minerals content		
9	Electrical profiling is best suited to map lateral electrical resistivity contrasts, such as lithologic contacts		
10	Pendulum and free-falling body methods are used to measure relative gravity		
11	The gravity acceleration at the pole is smaller than that at the equator		
12	The interpretation of resistivity data cannot yield information about truer resistivity and depths to layer interfaces		
13	Eötvös correction is applied to gravity data when a gravimeter is mounted on a moving platform		
14	One of the advantages of electrical resistivity method that it is less costly than drilling		
15	The force of one body acting on another is given by Galileo's law of gravitation		

16	The free-air effect is added if you are above sea-level and is subtracted if you are below sea-level		
17	One of the disadvantages of electrical resistivity method that the electrodes must be in a good contact with the ground		
18	Electrokinetic potentials result from the flowing of fluid through a capillary or porous medium		
19	Self-potential can be used to map the locations of water seepage in dams		
20	The typical gravity anomaly size does not vary greatly because of the very narrow range of rocks density		
21	The interpretation of SP is mostly quantitative		
22	Water filled voids will display a conductive response compared to air filled voids		
23	The self-potentials are almost invariably negative over the top of the sulphide deposit and are quite stable in time		
24	The sign of the self-potential is an important diagnostic factor in the interpretation of SP anomalies		
25	Sato and Mooney (1960) have provided the most complete explanation of the electrochemical processes caused the mineral SP anomalies		

B) Choose the correct answer of the following: - (25 marks, one mark each)

26) which of the followings are disadvantages of resistivity method:

- the electrode must be in a good contact with soil
- culture problems causing interference
- highly conductive or resistive surface layer
- all the above

27) Self-potential method is best suited for the exploration of:

- velocity of seismic layers
- massive ore deposits
- electrical resistivity of layers
- all the above

28) Electrical conduction occurs by:

- electronic conduction
- electrolytic conduction
- dielectric conduction
- all the above

29) Geophysical Methods can be classified as:

- pure vs applied
- active vs passive
- surface vs borehole
- all the above

30) To make Self-Potential measurements we need:

- a. high impedance voltmeter
- b. electric wires
- c. non-polarizable electrodes
- d. all the above

31) The electrical conduction occurred by the free electrons in metallic minerals is called:

- a. electronic conduction
- b. electrolytic conduction
- c. dielectric conduction
- d. atomic conduction

32) The normal gravity acceleration at the surface of the earth equals to:

- a. 9.8 m/s^2
- b. 980 Gal
- c. 9800 g.u.
- d. all the above

33) Seismic refraction method can be used to:

- a. depth and thickness of geologic strata
- b. depth to bedrock
- c. depth to water table
- d. all the above

34) The SI unit of electrical resistivity is:

- a. ohm
- b. m/sec
- c. ohm.m
- d. siemens/m

35) Electrokinetic potential may result from the gradient in:

- a. pressure
- b. temperature
- c. ion concentration
- d. none the above

36) Which of the followings control the resistivity of clay free and saturated rocks in Archie's law:

- a. pore fluid saturation
- b. resistivity of pore fluid
- c. pore water resistivity
- d. all the above

37) The variation in gravity acceleration from the pole to the equator equals to:

- a. 10%
- b. 5%
- c. 1%
- d. 0.5 %

- 38) Which of the following control the electrical resistivity of earth materials:
- magnetic susceptibility
 - water content
 - porosity
 - b and c
- 39) The presence of sulfide ore deposits can result in:
- Low positive SP anomaly
 - high negative SP anomaly
 - high positive SP anomaly
 - low negative SP anomaly
- 40) True resistivity can be obtained when the subsurface is:
- isotropic and homogeneous
 - anisotropic and homogenous
 - isotropic and inhomogeneous
 - anisotropic and inhomogeneous
- 41) For seismic refraction survey we need the following except:
- seismograph
 - electrodes
 - geophones
 - seismic sources
- 42) Which of the following techniques are used for electrical resistivity field survey:
- sounding
 - leap frog
 - common midpoint
 - a and c
- 43) The correction of gravity data due to the variation in density of earth materials is called:
- drift correction
 - free air correction
 - latitude correction
 - bouguer correction
- 44) Electrical resistivity method can be used to map:
- groundwater
 - minerals and Ore deposits
 - paleochannels
 - all the above
- 45) Self-potentials are generated by a number of natural sources such as:
- presence of metallic minerals
 - fluid streaming
 - electrochemical reactions
 - all the above

- 46) The non-polarizable electrode is consisting of:
- a. porous pot
 - b. metallic electrode
 - c. super saturated solution of the same electrode
 - d. all the above
- 47) The correction of gravity data due to environmental changes or tidal effect is called:
- a. drift correction
 - b. free air correction
 - c. latitude correction
 - d. bouguer correction
- 48) Subsurface cavities filled with air will show:
- a. resistive response
 - b. conductive response
 - c. no response
 - d. all the above
- 49) The primary seismic waves are:
- a. slower than secondary seismic waves
 - b. faster than secondary seismic waves
 - c. equal in speed to the secondary seismic waves
 - d. none the above
- 50) To record arrival times of seismic waves on land we use:
- a. hydrophones
 - b. electrodes
 - c. geophones
 - d. resistivity meters

=====Best wishes=====

End of questions

Instructor: Prof. Dr. Gamal Zidan Abdelaal

Good luck.....

الأمتحان التحريري في مقرر: حفريات لافقارية (215ج)
Invertebrate Paleontology (G215)

الزمن: ساعتان

الدرجة: 50 درجة

دور يناير: 2021م

ملحوظة: الإجابة بنفس الورقة الامتحانية في الجدول المبين بالورقة الأخيرة

First Question: Write True (T) or False (F) against the following questions in the table in the last page (35 marks; 1 mark each)

1. Fossil spore and pollen grains share more or less the same morphological features except that of wall structure, type & position of aperture.
2. Maceration (oxidation) is one of the essential steps in the standard palynological processing technique.
3. For classifying dinoflagellate cysts, number and arrangement of plates are very important criteria.
4. New and inexperienced HF users should be monitored by experienced laboratory personnel.
5. In a pollen tetrad, aperture is located at the proximal face.
6. Dinoflagellates are classified using the International Code of Zoological Nomenclature (ICZN) as protozoans.
7. Artificial "non-biological" classifications of spores and pollen grains are only useful for pre-Triassic material.
8. Dinoflagellates with a nucleus are classified under Dinokaryota.
9. Proximal face is that part of a palynomorph, which faces towards the centre of the tetrad, between equator and proximal pole.
10. Treatment of clay samples using sodium hexametaphosphate $[(NaPO_3)_6]$ provides more palynologically-productive residue than the acid treatment.
11. Brachiopod is classified into two orders according to presence of muscles and teeth
12. Spongia classification is depending only on their skeletal structure
13. Tabulate was an important reef formation during the Carboniferous
14. Order Calcarea is flourished during the Paleozoic Era
15. Superorder Ammonoidea has a geologic range extending from Devonian to Cretaceous
16. All the members of class Echinoidea has a pentameral symmetry
17. Heterodont dental plate in Bivalve shell consists of one cardinal teeth below the umbo as well as elongated lateral teeth
18. The classification of Anthozoa is based on the number of tabula as well as skeleton type and skeleton structure
19. Bivalve has a geologic range from Cambrian to Cretaceous, so it considers as an important index fossils
20. Cephalopods ammonitic suture line has a geologic range from Jurassic-Cretaceous
21. Spongia order Cornuspongia contains Ascon, Sycon, and Lycon types
22. Irregular echinoids are characterized by five-fold symmetry
23. Oysters is made up of two equal valves having one muscle
24. Anthozoa is marked by the dominance of the polyp form through its life cycle
25. Order Heteractinellida could be considers as a Paleozoic index fossil
26. The cardinal teeth in bivalve shells are usually lie on the both sides of the umbo
27. Colonial Tetracoralla corals are subdivided based on the relationship between the corallites
28. Spongia is generally marine animals but in some cases it could be fresh water
29. Phylum Archaeocyatha is classified based on the numbers of walls in their Skeleton
30. Tabulate and Tetracoralla are considered as important Mesozoic index fossils

31. The fossil remains of class Hydrozoa are very abundant during the geologic time
32. The skeleton of Anthozoa is composed of silica or calcium carbonate, and a thin layer of organic matter
33. The Echinoidea skeleton is marked by its endoskeleton type
34. Spongia is found to characterize the warm and cold regions
35. The Cnidaria medusa form has a geologic importance than the polyp form

Second Question: Choose the correct answer and write it in the table in the last page (15 marks; 1 mark each)

36. For a safe processing of palynological samples in lab, certain steps must be carried out:
 - a- Work in a purpose-built HF laboratory
 - b- Use an efficient HF fume-cupboard
 - c- Work under supervision of an experienced laboratory personnel
 - d- Wear full protective clothing
 - e- All of them
37. Trilete spores are characterized by.....symmetry.
 - a- Isopolar
 - b- Radial
 - c- Bilateral
 - d- Heteropolar
38. Criteria used in classification of spore/pollen grains are:
 - a- Type of aperture
 - b- Grain shape
 - c- Grain sculpture
 - d- Grain size
 - e- All of them
39. Extraction of palynomorphs using HCl/HF acid treatment is based on the concept that:
 - a- Palynomorphs are sensitive to oxidation and diagenesis processes
 - b- Palynomorphs are made of organic walls resistant to non-fumic acids
 - c- Palynomorphs are very small entities that are not sensitive to acids or alkali treatment
 - d- None of them
40. Kofoid's tabulation system is mainly based on:
 - a- Apical & antapical plates
 - b- Cingular plates
 - c- Sulcal plates
 - d- Anterior- & posterior intercalary plates
 - e- All of them
41.line is the juncture of the growing margin of the two valves in Brachiopods
 - a. Hinge
 - b. Commissure
 - c. Pallial
 - d. Moho
42. All of the following Spongia orders have skeleton made up of silica except.....
 - a. Calcareo
 - b. Cornacuspongia
 - c. Triaxonida
 - d. Heteractinellida
43. Tetracoralla are first appeared in.....Period
 - a. Devonian
 - b. Permian
 - c. Silurian
 - d. Ordovician
44. All of the following Cephalopod suture lines are Mesozoic index fossils except.....
 - a. Ammonitic
 - a. Ceratitic
 - a. Goniatitic
 - a. Nautiloid
45. Fresh water Spongia is restricted to.....Period.
 - a. Jurassic
 - b. Triassic
 - c. Carboniferous
 - d. Cambrian
46. The internal Ligament in Bivalve shells called.....
 - a. Resilium
 - b. Amphidetic
 - c. Opisodetic
 - d. None of them
47. Archaeocyatha has a geologic range restricted to.....
 - a. Cambrian
 - b. Cretaceous
 - c. Jurassic
 - d. Paleocene
48. The layer which composed of calcium carbonate crystals arranged perpendicular to the surface of the Bivalve shell known as.....
 - a. Periostracum
 - b. Prismatic layer
 - c. Lamellar layer
 - d. Inner layer
49. The interlocking plates that arranged in 10 double columns radiating out from the top of the upper surface of Echinoidea known as.....
 - a. Apical system
 - b. Corona
 - c. Madreporite
 - d. None of them

50. Order.....of Spongia is known as stone sponge.

a. Calcareo

b. Cornacuspongia

c. Tetraxonida

d. Heteractinellida

1		11		21		31		41	
2		12		22		32		42	
3		13		23		33		43	
4		14		24		34		44	
5		15		25		35		45	
6		16		26		36		46	
7		17		27		37		47	
8		18		28		38		48	
9		19		29		39		49	
10		20		30		40		50	

تمت الأسئلة مع التمنيات بالتوفيق

د. عمرو سعيد ضيف

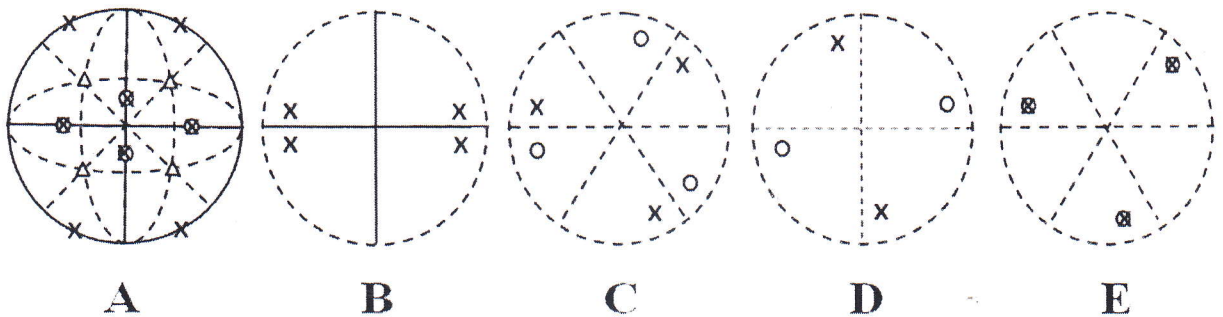
ا.د. عادل عبدالله حجاب

Answer the following questions:

1. Write what you now about ONLY FIVE of the following: (10 Marks)

General form - Inversion axis - Enantiomorphism – Polar axis – Tetrahedron
- First order prism – Dome

2. Write the Hermann-Mauguin symbols for the following stereograms and write the name of the form: (10 Marks)



3. Draw stereograms for ONLY SIX of the following forms and write their names:- (30 Marks)

- a) { 231 } in class 43m
b) { 110 } in class 222
c) { 101 } in class 4
d) { 1011 } in class 32

- e) { 2131 } in class 6m2
f) { 2131 } in class 3m
g) { 211 } in class 43
h) { 110 } in class 23

Good Luck, Prof. Dr. Wagih Bishara

يعقد الامتحان الشفهي عقب التحرير مباشرة بمكتب أ.د/ وجيه بشاره

Answer the following quations:

I- Crystallography (25 marks)

Indicate by the sign (✓) or (×) :

- 1-All system contain pinacoid ()
- 2-Rhombohedron present in hexagonal ()
- 3-Tetragonal system contain 6 planes and one four axis ()
- 4-Monoclinic system contains two planes ()
- 5 Pyramid is closed form ()
- 6-Prism is open form ()
- 7-Scalenohedron is closed form ()
- 8-Cube is closed form ()
- 9-A dome is parallel to a axis ()
- 10-Pidon has one face ()
- 11-All system contains prism form ()
- 12-All system contains bipyramid form ()
- 13-All system contains cube form ()
- 14-All system contains planes ()
- 15-All system contains octahedron form ()
- 16-All system contains pidon form ()
- 17-All system contains a-dome form ()
- 18-All system contains b-dome form ()
- 19-All system contains di-prism form ()
- 20-All system contains pyramid form ()
- 21-All system contains center ()
- 22-Tetragonal system contains one fourfold ()
- 23-Tetragonal system contains four twofold ()
- 24-Tetragonal system contains five planes ()
- 25-Hexagonal system contains one sixfold ()

PART II

26. Olivine is found in association with.....
A- Orthoclase B-Augite C-Mascovite
27. Hornblende is more present in..... rocks
A-Plutonic B- Volcanic C- Thermal metamorphic
28. The structural formula of mica is.....
A-Si₄O₁₀ B- Si₄O₁₁ C- Si₆O₁₁
29. If the number of electrons in a neutral atom is 35 and its mass number is 80; then the atomic number equal.....
A-35 B-45 C-80
30. One of the alteration products of calc-plagioclase is.....
A-Sericite B-Chlorite C-Epidote
31. The temperature of crystallization of hornblende is higher than that of.....
A-Forsterite B-Diopside C- Biotite
32. The rose colour of quartz is due to.....
A- Al₂O₃ B- Fe₂O₃ C- Li₂O
33. The perthitic feldspar results from intergrowth between.....
A-Albite and orthoclase B- Orthoclase and quartz
C-Albite and quartz
34. The degree of silica saturation of actinolite is higher than that of.....
A-Enstatite B-Mascovite C- Labradorite
35. The feldspar presents in granitic rocks is.....
A-Anorthoclase B- Labradorite C- Orthoclase
36. Andesine has anorthite content (CaO%) range from.....
A-10-30% B-30-50% C- 50-70%
37. The site Y in biotite contains cations.....
A- Al₄ B-(Mg, Al)₆ C-(Mg, Fe, Al)₆
38. The early stage of crystallization of basic magma; the olivine crystals are rich in.....
A-MgO B-Fe₂O₃ C- FeO
39. Which of these silicate minerals is anhydrous mineral?
A-Pyroxene B-Biotite C-Hornblende
40. The inert gases contain.....electrons in outer orbit
A-6 B-7 C-8
41. Which of these minerals doesn't showing pleochrism phenomena?
A- Enstatite B-Actinolite C-Biotite
42. Solid solution phenomena are present in.....
A-Amphibole B-Mica C-Olivine
43. Which of these minerals has a conchoidal fracture?
A-Sanidine B-Quartz C- Enstatite

44. Which of these minerals shows two sets of perpendicular cleavage?
A-Feldspar B-Amphibole C-Mica
45. One of these minerals has parallel extension.....
A-Biotite B-Anorthite C-Augite
46. Which of these properties can be seen under polarized light?
A-Shape of crystal B-Twining C-Extinction
47. One of these mineral crystallizes in triclinic system.....
A-Olivine B-Pyroxene C-Feldspar
48. Which of these minerals is common in metamorphic rocks?
A-Achinolite B-Quartz C-Hyperthine
49. What is the type of extinction in quartz?
A-Oblique B-Parallel C-Wavy
50. The type of twining in microcline is.....
A-Simple B-Lamellar C- Cross-hatching

Oral Exam (5 marks)

51. Feldspar has silica tetrahedron arranged in.....dimensions

A-One

B-Two

C-Three

52. The cations in position X in mica are.....

A-Na, K, Ca

B- Na, Al, Ca

C- Na, Fe, Ca

53. Augite is essential mineral in.....rocks

A-Acidic

B-Intermediate

C-Basic

54. The mineral that contains Na^+ cation in pyroxene is.....

A-Diopside

B-Aegirine

C-Enstatite

55. The mineral containing chlorine ion is.....

A-Feldspar

B-Amphibole

C-Pyroxene

56-Hexagonal system contains six twofold

()

57-Hexagonal system contains seven planes

()

58-Orthorhombic system contains three twofold

()

59-Orthorhombic system contains three planes

()

60-Trigonal system contains three planes

()

أصل وتكوين الصخور النارية

(٣٣٣ ج) المستوى الثالث

المطلوب الإجابة عن ٣ أسئلة فقط مما يلي:

السؤال الأول :- عرف باختصار مايتى:

- (أ) النسبة اليوتكتية (٣ درجات)
- (ب) الانصهار المغاير (٤ $\frac{1}{4}$ درجة)
- (ج) التبلور التجزيئى (٣ درجات)
- (د) تماثل الصهير (٦ درجات)

السؤال الثانى: أكتب عمايلي:-

- (أ) التفاعل بين الصهير البازلتى والحجر الجبرى (٨ درجات)
- (ب) التفاعل بين الصهير الجرانيتى والصخور القاعدية (٨ $\frac{1}{4}$ درجة)

السؤال الثالث:- أكتب بإيجاز ماتعرفه عن:

- (أ) الأقاليم البتروجرافية ومقترنات الصخور (٩ درجات)
- (ب) الأطوار المؤتلفة والأطوار المؤتلفة (٧ $\frac{1}{4}$ درجة)

السؤال الرابع :- علق على كل مما يلي:

- (أ) الطور الصهيري الصحيح شاملاً: الطورين الأول والثانى (٦ $\frac{1}{4}$ درجة)
- (ب) التركيب المعدنى الفعلى والمعادن النموذجية (١٠ درجات)

د. عثمان محمد النادى

أ.د. محمد السيد أحمد حبيب

Assiut University
Faculty of Science
Department of Geology



Date: March 2021
Time allowed: 2 hours

Final Exam

Gravity and Magnetic Prospection (G 351), Total of 50 Marks (use the bubble sheet for your answers)

A) Mark the following statements with True (v) or False (X): (25 marks, one mark each)

No	Statement	TRUE (v)	FALSE (X)
1	Ambiguity in gravity interpretations arise from the problem that different geological models could produce the same gravity anomaly		
2	The accuracy of gravity measurements in airborne survey is higher than the land survey		
3	Rocks with small concentration of ferro or ferri-magnetic minerals have the lowest magnetic susceptibility values		
4	The force of attraction between two bodies is directly proportional to the square of the distance between them		
5	The magnetic field changes significantly over time whereas the gravity field is relatively stable		
6	Gravity alone cannot distinguish between a strong density contrast at depth and a more diffuse contrast shallow		
7	Geomagnetic field is produced by electric currents induced within the conductive molten outer core as a result of slow convective movements within it		
8	The free-air effect is added if you are above sea-level and is subtracted if you are below sea-level		
9	The anomalous magnetic field result from crustal magnetization and anthropogenic sources		
10	The typical gravity anomaly size does not vary greatly because of the very narrow range of rocks density		
11	The externally magnetic field is mostly generated from circulating electric currents in the ionosphere		
12	In GRACE mission, the gravity field is measured by the accurate distance between the two satellite aircrafts		
13	The total magnetization is the sum of induced and remnant magnetization		
14	Eötvös correction is applied to gravity data when a gravimeter is mounted on a moving platform		
15	Magnetic field survey should be carried out when there is a magnetic storm		
16	Pratt's model for isostasy stated that all blocks float to the same depth but with different densities		

17	Bodies of identical shapes and intensity of magnetization can give rise to very different magnetic anomalies depending on their latitude		
18	Upward continuation suppresses the short wavelength magnetic anomaly		
19	Gradiometer survey will result in a high resolution of data for near surface features		
20	Salt dome will result in a gravity low anomaly		
21	Porosity and pore fluid are probably the most important factors affecting density in the shallow subsurface		
22	The linearity in magnetic anomaly may indicates possible strike of magnetic feature		
23	Ore deposit such as galena and pyrite represent a good target for gravity survey		
24	Air filled voids or cavities will result in a gravity low anomaly		
25	Localized, short wavelength gravity anomalies can originate only from shallow density inhomogeneity		

B) Choose the correct answer of the following: - (25 marks, one mark each)

26. The derivative method in local-regional separation of gravity data:
- enhances anomalies of shallow bodies and suppresses deep ones
 - enhances anomalies of deep bodies and suppresses shallow ones
 - enhances anomalies of shallow and deeper bodies
 - none the above
27. Magnetite is considered among the:
- paramagnetic materials
 - diamagnetic materials
 - antiferromagnetic materials
 - ferrimagnetic materials
28. The normal gravity acceleration at the surface of the earth equals to:
- 9.8 m/s²
 - 980 Gal
 - 9800 g.u.
 - all the above
29. The internally generated earth's magnetic field represents:
- 70% of the total magnetic field of the earth
 - 50% of the total magnetic field of the earth
 - 100% of the total magnetic field of the earth
 - 90% of the total magnetic field of the earth
30. The variation in gravity acceleration from the pole to the equator equals to:
- 10%
 - 5%
 - 1%
 - 0.5 %

39. The following are among the remnant magnetization except:
- isothermal
 - detrital
 - chemical
 - biological
40. The low pass filter in gravity data:
- remove high frequency and shorter wavelength
 - remove low frequency and longer wavelength
 - remove high frequency and longer wavelength
 - all the above
41. Changes in earth's magnetic field may result from:
- magnetic storms
 - diurnal effect
 - secular variations
 - all the above
42. The downward continuation is similar in effect to:
- high pass filter
 - low pass filter
 - tilt derivative
 - a and c
43. The following can be used as a criterion for the qualitative interpretation of gravity data:
- the density contrasts
 - the depth of target
 - the radius of target
 - all the above
44. The earth materials with diamagnetic behaviours has:
- negative magnetic susceptibility
 - complete electron shells
 - weak susceptibility
 - all the above
45. The Smith rule method can be used to calculate:
- the radius of the anomaly
 - the limiting depth of the anomaly
 - the mass of the normally
 - none the above
46. The inclination is defined as the deflection of the north seeking pole from:
- vertical
 - geographic north
 - horizontal
 - none the above

47. The diurnal changes in magnetic field are:

- a. low at night
- b. low at day
- c. high at night
- d. all the above

48. The following instrumentation can be used for measuring earth's magnetic field except:

- a. Proton precision
- b. Fluxgate
- c. Alki-vapor
- d. Lacoste Romberg

49. The followings are the advantages of the gradiometer magnetic survey except:

- a. don't have to align sensor with field
- b. fairly light weight yet rigged
- c. don't need to correct for diurnal variations
- d. can measure vector field

50. The magnetic method can be used to map the followings except:

- a. unexploded ordnance
- b. archaeological feature
- c. buried tanks and drums
- d. non-ferrous ore deposits

=====Best wishes=====

End of questions

Good luck.....

Instructor: Prof. Dr. Gamal Zidan Abdelaal

الأمتحان التحريري في مقرر: حفريات دقيقة و جيولوجيا تاريخية (315ج)
Micropaleontology & Historical Geology (G315)

الزمن: ثلاث ساعات

الدرجة: 50 درجة

دور يناير: 2021م

ملحوظة: الاجابة بنفس الورقة الامتحانية في الجدول المبين بالورقة الاخيرة

First Question: Write True (T) or False (F) against the following questions in the table in the last page (10 marks; 1 mark each)

- 1- Prasinophytes are considered as the ancestral to all the green algae.
- 2- For classifying dinoflagellate cysts, number and arrangement of plates are very important criteria.
- 2- Acritarch assemblages are only confined to nearshore marine conditions.
- 3- Treatment of clay samples using sodium hexametaphosphate $[(NaPO_3)_6]$ provides more palynologically-productive residue than the acid treatment.
- 4- Chitinozoan first appeared in the early Ordovician and has a post Devonian biostratigraphic importance.
- 5- Artificial "non-biological" classifications of spores and pollen grains are useful for Cenozoic material.
- 6- Maceration (oxidation) is one of the essential steps in the standard palynological processing technique.
- 7- Operculate pollen grains are characterized by isopolar symmetry.
- 8- Dinoflagellates are classified using the International Code of Zoological Nomenclature (ICZN) as protozoans.
- 9- Proximal face is that part of a palynomorph, which faces towards the centre of the tetrad, between equator and proximal pole.
- 10- Dinoflagellates with a nucleus are classified under Dinokaryota.

Second Question: Choose the correct answer and write it in the table in the last page (40 marks; 1 mark each)

- 11- Most microfossils measure under what size?
a) under 1 mm b) under 1 meter c) under 1 foot d) under 1 yard
- 12- Most microfossils are
a) Prokaryotic b) Unicellular c) Multicellular d) none of these
- 13- Diatom is a general term used to describe like protists.
a) algae b) Fungi c) Animal d) Bacteria
- 14- Amoeba is an example of which type of protist?
a) Animal-like protists b) Plant-like protists c) Fungi-like protists d) Bacteria-like protists
- 15- The shell of a coccolith is made of
a) Silica b) calcium carbonate. c) calcium sulfate. d) none of these
- 16- A shell that is made of calcium carbonate is called a
a) frustule. b) bloom. c) test. d) Chloroplast
- 17- is (are) classified under Kingdom Protista
a) nannofossils b) Protozoa c) Ostracoda d) conodont

- 18- Which of the following is NOT a member of protozoa?
a) Pollen b) amoeba c) bacteria d) fungi
- 19- The shell of a conodont is made of
a) Silica b) calcium carbonate. c) calcium phosphate. d) none of these
- 20- The shell of a fresh water foraminifera is made of
a) chitinous b) calcium carbonate. c) Silica d) all of these
- 21- Fossils are most common in which rock types?
a) Sedimentary b) igneous c) metamorphic d) all of these
- 22- The wall structure of planktonic foraminifera are made of
a) agglutinated b) calcareous. c) siliceous d) all of these
- 23- The marine depth which receives non-sufficient light for photosynthesis is known by
a) Dysphotic b) photic c) aphotic d) light zone
- 24- Benthonic foraminifera are useful in studies.
a) Paleoenvironmental b) paleopathymetry c) paleoceanography d) all of these
- 25- Normal sea water has
a) alkaline b) acidic c) neutral d) none of these
- 26- Foraminiferal genera live in water environments.
a) hyposaline b) hypersaline c) normal sea d) all of these
- 27- CaCO_3 more soluble in water.
a) cold b) warm c) temperate D) all of these
- 28- Below the level of complete CO_3 dissolution, only some genera are preserved.
a) Agglutinated b) calcareous hyaline c) calcareous pocellaneous d) none of these
- 29- Dissolved oxygen depends on
a) ocean circulation b) fluxes of organic matter to the sea floor c) depth d) all of these
- 30- The hinge is the simplest type which lacks any teeth and sockets.
a) adont b) merodont c) amphidont d) isodont
31. The Phanerozoic Eon is broken into several shorter Eras. In order of their occurrence, from earliest to most recent, those Eras are:
a) Mesozoic, Paleozoic, Cenozoic b) Cenozoic, Mesozoic, Paleozoic
c) Paleozoic, Mesozoic, Cenozoic d) Cenozoic, Paleozoic, Mesozoic
32. The group of marine invertebrates that dominte the fossil record of the early Paleozoic are the..
a) rugose corals b) fusulinids c) trilobites d) non of these
33. The first vertebrates to invade the land were the
a) mammals b) reptiles c) insects d) amphibians
34. The Phanerozoic began with the Cambrian Explosion about
a) 65 million years ago b) 251 million years ago
c) 545 million years ago d) 1,000 million years ago
35. The collision of Laurentia with Baltica caused the Orogeny during the Silurian and Devonian.
a) Laramide b) Acadian c) Sevier d) Caledonian
36. In order of their occurrence, from earliest to most recent, the periods of the Paleozoic include
a) Silurian, Carboniferous, Permian b) Carboniferous, Silurian, Permian
c) Permian, Carboniferous, Silurian d) Permian, Silurian, Carboniferous
37. The largest of the early Paleozoic continents was which included all of the modern continents of the southern hemisphere.
a) Baltica b) Gondwanaland c) Laurentia d) Siberia
38. The Cretaceous period is named for the abundant deposits ofthat characterize it.
a) coal, deposited in swampy areas

- b) chalk, composed of the skeletons of calcareous nannoplankton
 c) gypsum, deposited as evaporites in shallow seas
 d) conglomerate, deposited along stream channels
39. All of the following are periods of the Mesozoic, except
 a) Jurassic b) Paleogene c) Cretaceous d) Triassic
40. The Paleozoic does not include the
 a) Ordovician b) Jurassic c) Carboniferous d) Permian
41. The was an era dominated by the dinosaurs
 a) Precambrian b) Paleozoic c) Mesozoic d) Cenozoic
42. The boundaries between..... seem to coincide with major changes in the life forms present on Earth
 a) Precambrian b) eras c) epochs d) systems
43. What is the name for an erosion surface that separates two sets of sedimentary layers with non-parallel bedding planes?
 a) cross-bedding b) formation c) fault d) angular unconformity
44. Which of the following is used by geologists to determine the relative ages in a rock sequence?
 a) stratigraphy b) fossils c) cross-cutting relationships d) all of these
45. Land plants appeared during the Period?
 a) Cambrian b) Silurian c) Triassic d) Permian
- 46- Extraction of palynomorphs using HCl/HF acid treatment is based on the concept that:
 a) Palynomorphs are sensitive to oxidation and diagenesis processes
 b) Palynomorphs are made of organic walls resistant to non-fuming acids
 c) Palynomorphs are very small entities that are not sensitive to acids or alkali treatment
 d) None of them
- 47- In prasinophytes the excystment opening is referred to as:
 a) Operculum b) Cyclopyle c) Archeopyle d) all of them
- 48- The outer wall layer "Exine" of pollen grains consists of:
 a) Intine b) Ectexine c) Endexine d) all of them
- 49- Kofoed's tabulation system is mainly based on:
 a) Apical & antapical plates b) Cingular plates c) Sulcal plates
 d) Anterior- & posterior intercalary plates e) All of them
- 50- Informal groupings (classification) of acritarchs have been established on:
 a) wall structure and morphology of vesicle b) type of excystment opening
 c) presence or absence of processes d) ornamentation e) all of them

1		11		21		31		41	
2		12		22		32		42	
3		13		23		33		43	
4		14		24		34		44	
5		15		25		35		45	
6		16		26		36		46	
7		17		27		37		47	
8		18		28		38		48	
9		19		29		39		49	
10		20		30		40		50	

تمت الأسئلة مع التمنيات بالتوفيق،، ا.د. ناجح عبدالرحمن عبيدالله -- د. عمرو سعيد ضيف

Assiut University		جامعة أسيوط
Faculty of Science-Geology Dept		كلية العلوم- قسم الجيولوجيا

Rocks (G324)

Time: Three Hours

Jun., 2021

1-Igneous R.

I-Indicate by the sign (✓) or (×): (32 Marks)

- 1- A pegmatite rock is Very coarse ()
- 2- The grain size of granite is coarse ()
- 3- The grain size of gabbros is coarse ()
- 4- The grain size of rhyolite is coarse ()
- 5- The grain size of basalt is coarse ()
- 6- The grain size of andesitic is coarse ()
- 7- The grain size of diorite is coarse ()
- 8- The grain size of peridotite is coarse ()
- 9- The occurrence of pegmatite is plutonic ()
- 10- The occurrence of peridotite is plutonic ()
- 11- The occurrence of granite is plutonic ()
- 12- The occurrence of rhyolite is plutonic ()
- 13- The occurrence of obsidian is plutonic ()
- 14- The occurrence of basalt is plutonic ()
- 15- The occurrence of gabbros is plutonic ()
- 16- The occurrence of diorite is plutonic ()
- 17- The occurrence of andesite is plutonic ()
- 18- The texture of andesitic is hypidiomorphic texture ()

2-Metamorphic R.

- 19- Schist is a foliated metamorphic rock ()
- 20- Slate is a foliated metamorphic rock ()
- 21- Gneiss is a foliated metamorphic rock ()
- 22- Amphibolites are a foliated metamorphic rock ()
- 23- Migmatites is a foliated metamorphic rock ()
- 24- Mylonites is a foliated metamorphic rock ()
- 25- Phyllonites is a foliated metamorphic rock ()
- 26- Ultramylonites is a foliated metamorphic rock ()
- 27- Phyllite is a foliated metamorphic rock ()
- 28- Shale is changed during metamorphism into slate ()
- 29- Gneiss rocks is regional metamorphism ()

- 30-Schist rocks is regional metamorphism ()
31- Migmalites is mixed rocks ()
32-Slate rocks is regional metamorphism ()

Oral Exam (5 Marks)

- 1-Mylonite rocks is regional metamorphism ()
2-Hornfels rocks is regional metamorphism ()
3-Agent of thermal metamorphism is pressure ()
4-Types of metamorphic rocks are regional, thermal and dynamic ()
5-Composition of quartzite is quartz ()

PART II: SEDIMENTARY ROCKS

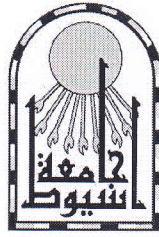
Indicate by the mark (X) or (✓) and correct the incorrect sentences for ONLY Eighteen (18) Questions:

- 1) Plagioclases are less abundance in sedimentary rocks than potassium feldspars ().
- 2) Quartz arenites are poor in feldspar than quartz ().
- 3) Eolian sands commonly have a higher sphericity than water transported sand ().
- 4) Fabric is the overall appearance of a particle ().
- 5) Calcite is the main mineral constituent of the evaporate minerals ().
- 6) Extraformational conglomerates are derived from outside the depositional basin ().
- 7) Lithic fragments provide the most specific information about sandstone provenance ().
- 8) Beaches tend to have sands that are better sorted and with more common coarse tail skewness than river sands ().
- 9) Heavy minerals are coarser than the less dense rock-forming minerals with which they are deposited ().
- 10) Cementation is the most effective means of creating secondary porosity ().
- 11) Angularity reflects a lack of transport by water prior to deposition ().
- 12) Paraconglomerate is a conglomerate, in which all clasts are in contact with other clasts, i.e., the grain supports the clasts ().
- 13) Roundness is a description of how angular the edges of a particle are ().
- 14) Glacial till that is transported within glacial ice is typically angular in shape ().
- 15) In general, permeability increases with primary porosity ().
- 16) Permeability is related to how easily a fluid will pass through any granular material ().
- 17) Sphericity is how closely a particle's shape resembles a sphere ().
- 18) Quartwackes are rich in matrix more than 15% ().
- 19) Porosity that develops at the time of deposition is termed secondary porosity ().
- 20) Breccia is composed of angular fragments indicating that they did not travel far from their source ().

Oral Exam:

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

- 1) The principal purely chemical sedimentary rock type is evaporate ().
- 2) Porosity refers to the volume of void space (available to contain fluid or air) in a sediment or sedimentary rock ().
- 3) Carbonate rocks are major reservoirs of groundwater and petroleum ().
- 4) Intraformational conglomerates are normally very angular and poorly sorted ().
- 5) Precipitation of new minerals from pore waters causes cementation of the grains and acts to fill the pore spaces, reducing porosity ().



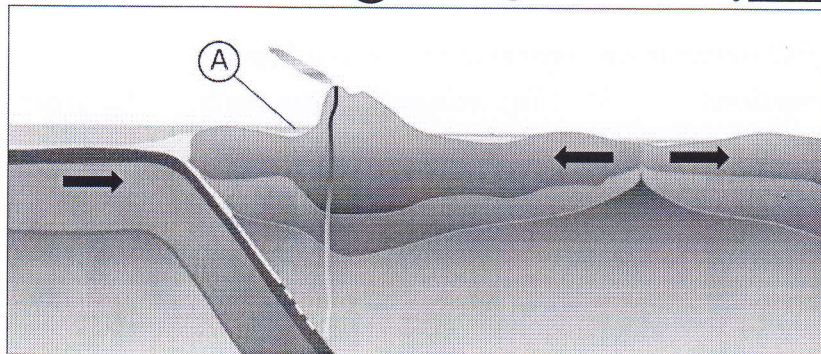
Sedimentary Environments and Sedimentary Basins (G335)

Answer the following questions: (50 Marks)

تنبيه هام : يتم طمس (تسويد) الاجابة المختارة من قبل الطالب باستخدام القلم الجاف فقط
في ورقة الاجابة المرفقة مع الأسئلة

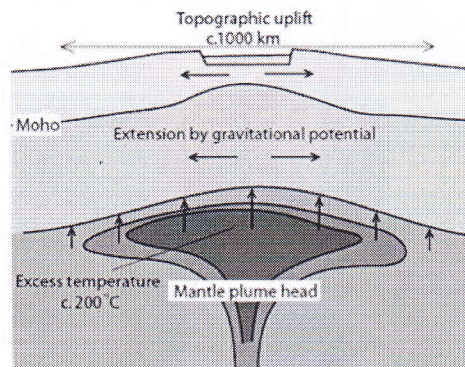
Choose the correct answer: (25 Marks)

1. Continental sedimentary environments are represented by _____
(A) Coastal sediments (B) Pelagic sediments (C) Aeolian sediments
2. Which country is most affected by the tsunami?
(A) Philippines (B) South Africa (C) Neither A nor B
3. In the given diagram letter (A) showing the location of _____ basin



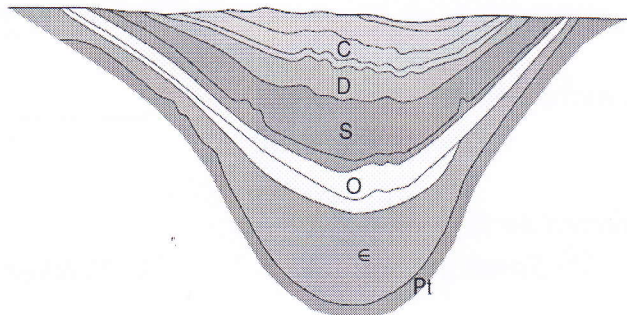
- (A) Forearc (B) Foreland (C) Trench
4. Miocene gypsum deposits of Egypt were accumulated in _____
(A) Continental environment (B) Transitional environment (C) Both A and B
 5. Passive margins represent _____ of the total percentage of sedimentary basins in the world.
(A) 16% (B) 26% (C) 46%

6. The given figure represents _____



- (A) Active rifting (B) Passive rifting (C) Transitional stage

7. The given figure represents _____ basin

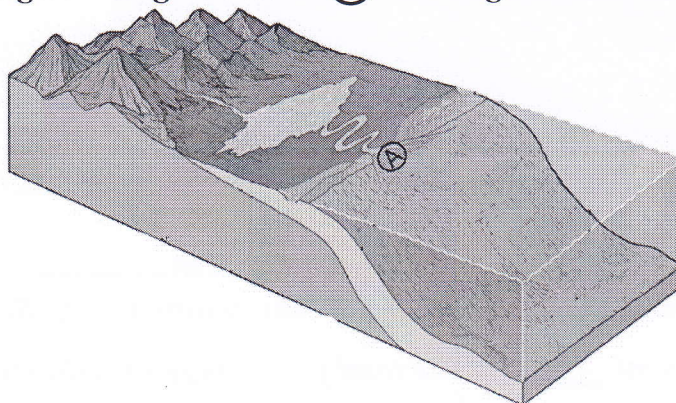


- (A) Symmetrical (B) Asymmetrical (C) Semi-symmetrical

8. Which of the following is an important source of dust?

- (A) Volcanic eruptions (B) Clay minerals from soils (C) Both A and B

9. In the given diagram letter (A) showing the location of _____

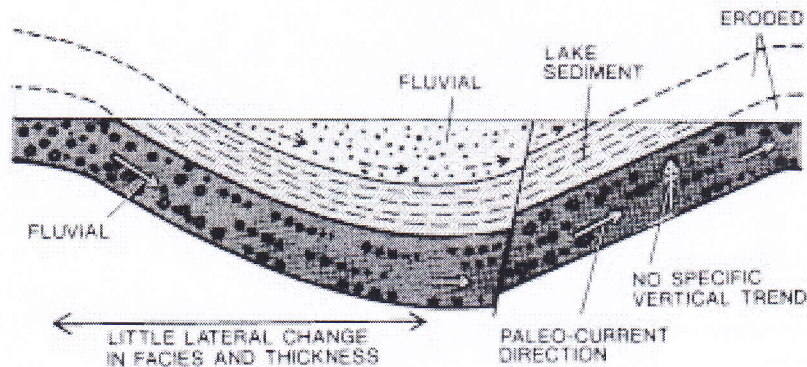


- (A) Alluvial fan (B) Submarine fan (C) Fan delta

10. Pre-depositional sedimentary structures are represented by _____

- (A) Cross-bedding (B) Ripple marks (C) Flute marks

11. The given figure represents _____ sedimentary basin



- (A) Post-depositional (B) Syn-depositional (C) Pre-depositional

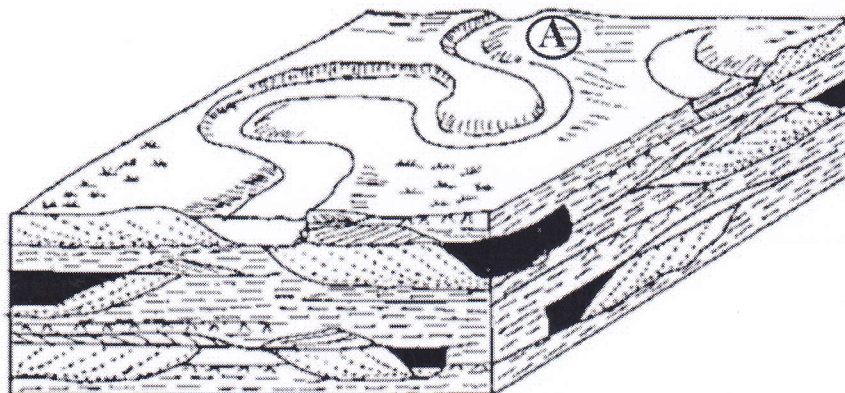
12. Transitional sedimentary environment is represented by _____

- (A) Lake sediments (B) Tidal flat sediments (C) Fluvatile sediments

13. The sediment thickness of Abu El Gharadiq basin of Egypt is about _____

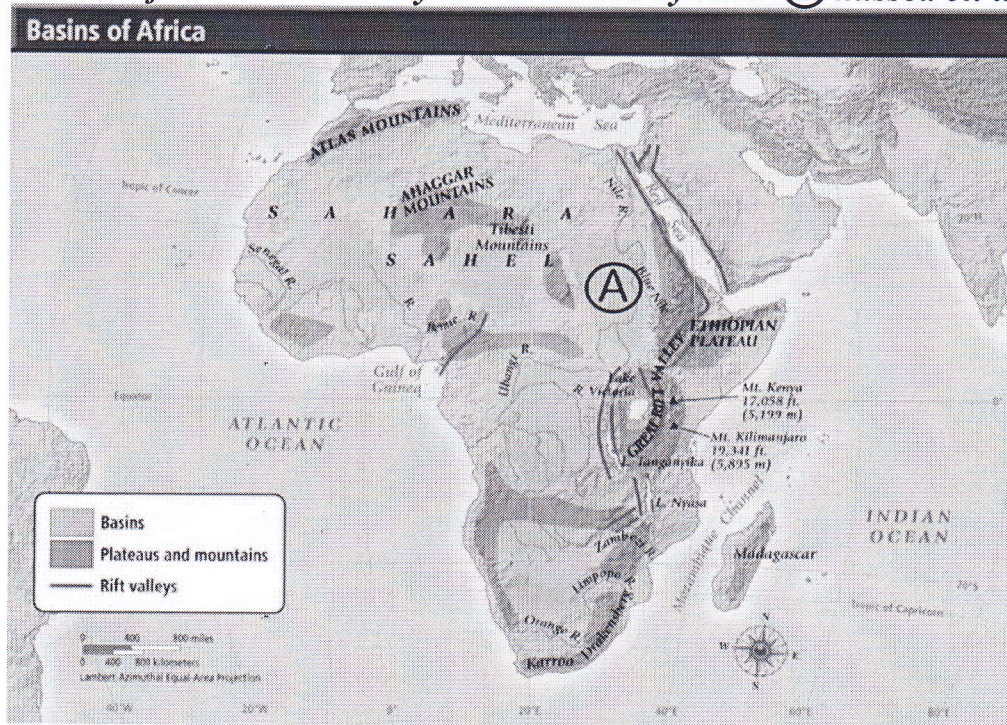
- (A) 10000m (B) 1000m (C) 100m

14. In the given diagram letter (A) marks the location of _____



- (A) Point bar (B) Levee (C) Channel deposits

15. Which African sedimentary basin marked by letter **(A)** missed on the given map?

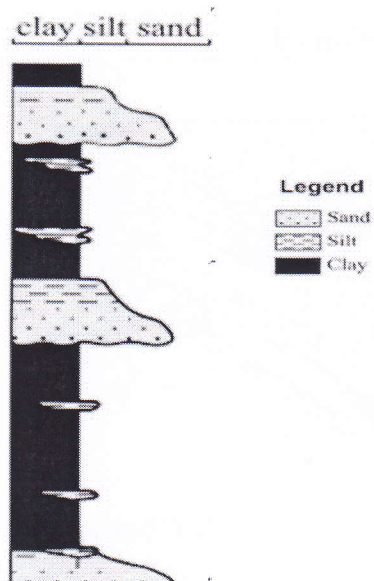


(A) Congo basin

(B) Sudan basin

(C) Kalahari basin

16. The given figure represents _____

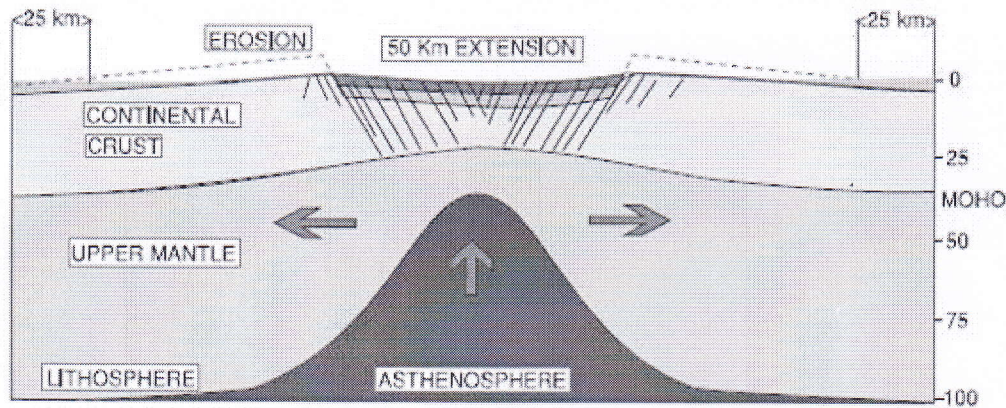


(A) Symmetrical cycles

(B) Asymmetrical cycles

(C) Truncated cycles

17. The given figure represents _____ stage of the rift valley formation



- (A) Pre-rift basin (B) Graben formation (C) Rift basin

18. The rate of subsidence is commonly varying in sedimentary basins between _____

- (A) 1-20 cm/year (B) 100-200cm/year (C) 1-2km/year

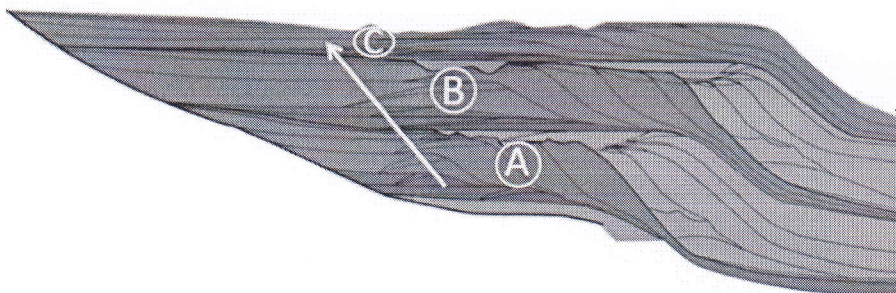
19. What is the term for a curved sandbar that forms on the inside curve of a stream?

- (A) Meander (B) Point bar (C) Dune

20. Zohr gas field of Egypt was discovered in _____

- (A) 2014 (B) 2015 (C) 2017

21. The given figure represents _____

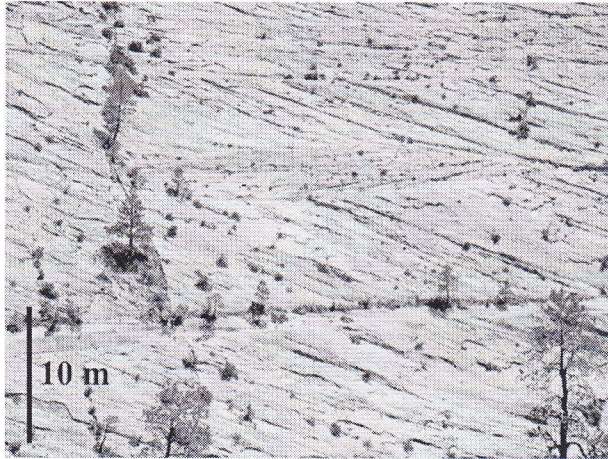


- (A) Delta progradation (B) Delta retrogradation (C) Neither A nor B

22. The largest sedimentary basin all over the world is represented by _____

- (A) Junggar basin (B) Congo basin (C) Amazon basin

23. The given photo which is built up exclusively of sandstones represents _____

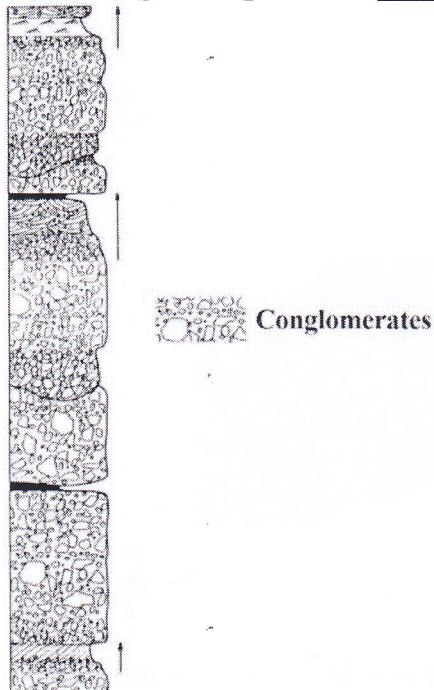


- (A) Fluvatile sediments (B) Aeolian sediments (C) Marine sediments

24. Neap tide occurs when the Sun, Earth & Moon are _____

- (A) In direct line (B) In right angle (C) In oblique angle

25. The given figure represents _____ facies



- (A) Braided stream (B) Meandering stream (C) Anastomosing stream

Which of the following is true (T) and which is false (F): (25 Marks)

26. Fertilizer materials of Egypt were accumulated in marine environment

☐ T

☐ F

27. Coal deposits of Sinai were accumulated in a transitional environment

☐ T

☐ F

28. Delta forms only where rivers enter seas

☐ T

☐ F

29. Eustatic sea-level changes do not affect the size and shape of sedimentary basins

☐ T

☐ F

30. Pelagic sediments are located within the marine environment shallower than the neritic one

☐ T

☐ F

31. Dolomites are related mainly to supratidal settings

☐ T

☐ F

32. All the sedimentary basins of Egypt belonging to the same age

☐ T

☐ F

33. El Gindi basin of Egypt is located in the Gulf of Suez region

☐ T

☐ F

34. Placer deposits are well represented in the Western Desert of Egypt

☐ T

☐ F

35. Well-rounded grains indicate higher maturity of the sediments

☐ T

☐ F

36. *Ancient aeolian sediments are frequently documented in the sedimentary package of Egypt than the fluviatile ones*

☐ T

☐ F

37. *No marked thickness variation in sediments can be observed in the post-depositional sedimentary basins*

☐ T

☐ F

38. *Diurnal tides mean only a single high and a single low during each tidal day*

☐ T

☐ F

39. *Both the black shales and black sands of Egypt were accumulated under the fluviatile system*

☐ T

☐ F

40. *In the past time, Egypt was subjected to strong rainfall and torrents much more than the present*

☐ T

☐ F

41. *Piggyback and remnant ocean basins are related to compressional processes*

☐ T

☐ F

42. *Commercial white sands of Egypt occur in the northwestern desert*

☐ T

☐ F

43. *Transtensional and transcompressional basins are related to horizontal stresses (lithosphere shearing)*

☐ T

☐ F

44. *Supratidal and subtidal sediments have the same characteristics*

☐ T

☐ F

45. *Deltaic sediments are not important sites for hydrocarbon accumulation*

☐ T

☐ F

46. *Komombo basin of Egypt is mainly built up of siliciclastics*

(T)

(F)

47. *Volcanogenous material is more frequent in the onshore basins than the offshore ones*

(T)

(F)

48. *The existence of laminated sediments witnessed their accumulation under turbulent water conditions*

(T)

(F)

49. *Textural characteristics of ancient sediments are more important than field observations in the interpretation of ancient sedimentary environments.*

(T)

(F)

50. *Bedload sediments of the fluvial system are necessary for ceramic and porcelain industries*

(T)

(F)

Ezzat A. Ahmed

Good Luck



First Semester, Third Level Final Examination

Time: 2hours	Total marks: 50	Seismic Exploration and Earthquake Seismology (G350)	January, 2021
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1. Put ONLY True or False.

(38 marks)

- Seismic prospecting methods are particularly well suited to the mapping of layered sedimentary sequences and are therefore widely used in the search for oil and gas.
- Seismic prospecting methods depend mainly upon the change of the elastic properties of the rock materials of the Earth.
- Seismic waves are parcels of elastic strain energy that propagate outwards from a seismic source such as an earthquake or an explosion.
- Hooke's law stated that "Up to a certain limiting value of stress, known as the yield strength of a material, the strain is directly proportional to the applied stress".
- When the seismic wave encounters a point at an interface between two different rock types with different acoustic impedance ($\rho_1 v_1 \neq \rho_2 v_2$), this point acts as a new source for generating the seismic waves energy.
- Consider the situation where saline water intrudes into a near-surface aquifer, seismic methods would not work as there is no significant difference in seismic wave velocities between the two saturated zones.
- Head waves travel back to the surface and can be recorded at a distance of the shot point known as critical distance.
- Shear waves propagate by a pure shear strain in a direction perpendicular to the direction of wave travel.
- S-waves can only propagate in solids, and they can not travel through pore spaces at all.
- The time-distance curve for the reflected waves from dipping interface is a hyperbola whose axis of symmetry is the time axis.
- Moveout is defined as the difference between the travel times t_1 and t_2 of reflected-ray arrivals recorded at two offset distances x_1 and x_2 .
- A horizontal gas-oil, gas-water, or oil-water contact produce a distinct reflection, especially where the reservoir is thick; such a reflection is called a flat spot hydrocarbon indicator.
- When S-wave ray is obliquely incident on the solid-solid interface, four types of waves are generated; two reflected P- and S-waves and two transmitted P- and S-waves.
- The travel time of a reflected ray is given by: $t_{refl} = \frac{(x^2 + 4z^2)^{1/2}}{v_1}$ which is the equation of a hyperbola.
- Vibroseis is the most common non-explosive source used for reflection surveying.
- Devices used on land to detect seismic ground motions are known as seismometers or geophones. While, in water, the passage of a compressional seismic wave is marked by transient pressure

changes and these are detected by hydrophones.

17. In the longitudinal profile, the detectors are laid out a line that does not pass through the shot point.
18. Distance between the shot point and the last geophone is called spread. It has a direct relation with the detected depth, where the detected depth in most cases equals 3 to 5 spread length.
19. Reconnaissance surveys tend to have coarser station intervals in order to cover a large area quickly and to indicate zones over which a more detailed survey should be conducted.
20. Compressional waves propagate by compressional and dilatational uniaxial strains in the direction of wave travel.
21. Multiples are those rays that return to the surface after reflection at more than one interface.
22. Fold or multiplicity is the number of times that the same midpoint is sampled by different shots and different receivers.
23. When P-wave ray is obliquely incident on interface between solid-liquid mediums, three types of waves are generated; two reflected P- and S-waves and only P-wave transmitted.
24. Air gun is the most common source used for marine seismic surveys.
25. The travel time of a refracted ray is given by: $t_{refr.} = \frac{x}{v_2} + \frac{2z \cos \theta_c}{v_1}$ which is the equation of a straight line having a slope of $1/V_2$.
26. The origins of Love wave is Rayleigh wave and S-wave.
27. Presence of total internal reflection caused by incidence with smallest angle or critical angle.
28. The damage occurs when the natural frequency of the layer match the natural frequency of any engineering structure embedded on it.
29. Fourier analyses consist of real part and image part that are divided by the Nyquist frequency.
30. Ray tracing theory depends basically on Snell's law for flat layers.
31. First S-wave motions are either upward or away from the source, or arrive downward or toward the source.
32. Focal mechanisms are constructed using P-wave first motions frequencies.
33. Upward P-wave polarities at stations are experiencing pushing you away from the source of the earthquake, whereas downward P-wave polarities at stations are experiencing pulling toward the source of the earthquake.
34. Liquefaction is a process resulting in a soil's loss of shear strength, due to a transient excess of pore water pressure.
35. Hypocenter is the location of initial radiation of seismic waves (i.e., the first location of dynamic rupture).
36. Seismic beach ball is the moment generated by the forces generated on an earthquake fault during slip.
37. Amplification is the rate at which earthquake ground motion decreases with distance.
38. A wave starting as P, transmitted into the core, and again emerging as P, is denoted by PcP

(12 marks)

Choose the correct answer from (A), (B), and (C).

- 1) is a wave starting as S, transmitted into the outer core, once reflected inside the outer core boundary, and emerging as S.
A) SKKS B) SKiKS C) SKJKS
- 2) The origin of Love wave is
A) Primary wave B) Shear wave C) surface wave
- 3) The occurs when the natural frequency of the layer match the natural frequency of any engineering structure embedded on it.
A) resonance B) amplification C) liquefaction
- 4) Fourier analyses consist of real part and image part. The real part and image part are divided by the.....
A) folding frequency B) predominant frequency C) cut-off frequency
- 5) is the wave frequency multiplied by 2π , and used to create harmonic sine or cosine waves.
A) angular frequency B) cut-off frequency C) Wave frequency
- 6) Snell's law for spherical layers uses incidence angles and, whereas Snell's law for flat layers uses incidence and refraction angles only.
A) layer S-wave velocity B) layer P-wave velocity C) layer thicknesses
- 7) Upward polarity of P-waves ground motion indicates an in the source region.
A) compression B) contraction C) expansion
- 8) sequences can provide valuable hints about fault plane orientation at depth.
A) Beforeshocks B) aftershocks C) mainshocks
- 9) The is a plane perpendicular to the line describing the direction of slip in the earthquake
A) auxiliary plane B) fault plane C) footwall
- 10) Upward P-wave polarities at stations are experiencing pushing you the source of the earthquake
A) away from B) toward C) normal to
- 11) Resonance effects are caused by a in the medium properties, which leads to trapped waves with multiple reflections within the layer.
A) homogeneity B) heterogeneity C) discontinuity
- 12) is an increasing modification of the input bedrock ground motion by the overlying unconsolidated materials.
A) Attenuation B) amplification C) resonance

End of questions

GOOD LUCK

Dr. Mostafa Thabet

Dr. Rashad Sawires

Assiut University
Faculty of Science
Department of Geology



Date: March 2021
Time allowed: 2 hours

Final Exam

Electrical Prospection (G 358), Total of 50 Marks (use the bubble sheet for your answers)

=====

A) Mark the following statements with True (v) or False (X): (25 marks, one mark each)

No	Statement	TRUE (v)	FALSE (X)
1	GPR method can be used in urban and forensic applications		
2	Induced polarization method is extensively used for the exploration of disseminated metal-based minerals		
3	The IP effect increases with the increasing in surface charge density at mineral-fluid interface		
4	The depth in GPR increases with the increasing of the subsurface electrical conductivity		
5	DC resistivity method depends on the storage of current whereas the induced polarization method depends on the flow of current		
6	In GPR the attenuation of EM energy is primarily controlled by the electrical conductivity of the subsurface		
7	The electrical double layer consisting of the adsorbed layer and the diffused layer		
8	The propagation of EM waves in GPR depends only on the dielectric properties of the subsurface		
9	The diffraction hyperbola in GPR record result from a point source		
10	The electrical current transport in the subsurface is the sum of current flow and current storage		
11	Electrode polarization results from the transition between electrolytic and electronic conduction at the interfaces between pore fluids and metallic minerals in the rock		
12	The depth to target in GPR can be determined if the propagation velocity of the electromagnetic energy (V_m) through the material is known		
13	IP method can be used to map lithologic variations in the subsurface		
14	The EM wave velocities in GPR can be estimated from the dielectric constant of the subsurface		
15	In GPR, higher vertical resolution results from the higher EM frequency		

16	The presence of metallic minerals in the subsurface will have no effect on the voltage decay during induced polarization measurements		
17	The depth of penetration in GPR is very limited (less than 100 m)		
18	There is a tradeoff between a penetration depth and resolution in GPR method		
19	Electrode polarization is smaller in magnitude than normal or background IP effect		
20	In GPR, the lower the frequency, the higher depth of penetration and higher resolution		
21	In GPR, the vertical resolution is a measure of the ability to recognize individual, closely spaced reflectors		
22	Membrane polarization is largest when a rock contains clay materials scattered through the matrix		
23	Dipole-dipole array is best suited for IP measurements to minimize the electromagnetic coupling effect		
24	The phase shift in IP is the difference between the in the input current and output voltage in radians		
25	Surface area is the most important factor controlling the IP effect		

B) Choose the correct answer of the following: - (25 marks, one mark each)

26) The GPR method is best suited for exploring:

- a) deeper subsurface structures
- b) archaeological remains
- c) geothermal resources
- d) radiometric minerals

27) In the IP method, the increase in pore fluid chemistry will result in:

- a) general decrease in IP magnitude
- b) general increase in IP magnitude
- c) decrease and then increase in IP magnitude
- d) increase and then decrease in IP magnitude

28) As a rule of thumb, the vertical resolution in GPR method is equal to:

- a) $1/2$ the wavelength of the EM wave
- b) $1/4$ the wavelength of the EM wave
- c) $1/3$ the wavelength of the EM wave
- d) $1/10$ the wavelength of the EM wave

29) The induced polarization method is classified as:

- a) surface method
- b) active method
- c) electrical method
- d) all of the above

- 30) The survey mode of GPR in boreholes is called:
- a) continuous profiling mode
 - b) common midpoint mode
 - c) transillumination mode
 - d) sounding mode
- 31) The propagation velocity of EM waves in GPR survey can be estimated from:
- a) dielectric permittivity of the subsurface
 - b) electrical conductivity of the subsurface
 - c) density of the subsurface
 - d) magnetic permeability of the subsurface
- 32) The IP method can be used to map:
- a) disseminated metallic minerals
 - b) lithology
 - c) salt-water intrusion
 - d) all of the above
- 33) The IP method is a primary tool to explore:
- a) porphyry cuppers deposits
 - b) bedded lead-zinc deposits
 - c) sulphide related gold deposits
 - d) all of the above
- 34) The following methods can be used to estimate depth from GPR records except:
- a) relative dielectric permittivity
 - b) shoot to target of known depth
 - c) hyperbola fitting
 - d) chargeability estimation
- 35) In the IP method, the subsurface earth materials act as:
- a) capacitor
 - b) conductor
 - c) insulator
 - d) none of the above
- 36) The IP effect decreases with increasing:
- a) surface area
 - b) surface charge density
 - c) porosity
 - d) metallic minerals
- 37) Which of the following modes can be used to acquire GPR survey:
- a) sounding model
 - b) profiling mode
 - c) sounding profiling mode
 - d) common midpoint mode (CMP)

- 38) Which of the following is controlling the propagation of EM waves in GPR survey:
- a) dielectric permittivity of the subsurface
 - b) electrical conductivity of the subsurface
 - c) magnetic permeability of the subsurface
 - d) all of the above
- 39) If the target in GPR is much smaller than the footprint size then:
- a) the target will not be imaged
 - b) the target will be highly imaged
 - c) part of the target will be imaged
 - d) all of the above
- 40) Which of the following physical factors control the propagation of EM waves in GPR survey:
- a) lithology
 - b) porosity
 - c) water content
 - d) all of the above
- 41) The induced polarization method depends on the:
- a) flow of current in the subsurface
 - b) storage of current
 - c) both flow and storage
 - d) none of the above
- 42) The membrane polarization is most pronounced in rocks containing:
- a) silicate minerals
 - b) iron minerals
 - c) carbonate minerals
 - d) clay minerals
- 43) The selection of antenna in GPR survey depends on:
- a) depth of penetration
 - b) quality of penetration
 - c) resolution of penetration
 - d) all of the above
- 44) The IP method is effective in mapping the subsurface lithology because it is very sensitive to changes in:
- a) surface area
 - b) surface charge density
 - c) ionic mobility
 - d) none of the above

- 45) In GPR survey, high frequency antenna will result in:
- a) greater penetration depth and lower resolution
 - b) lower penetration depth and higher resolution
 - c) lower penetration depth and lower resolution
 - d) greater penetration depth and higher resolution
- 46) For IP measurements it is recommended to use:
- a) copper electrodes
 - b) non-polarizable electrodes
 - c) stainless steel electrodes
 - d) all of the above
- 47) The membrane polarization builds up due to variations in:
- a) ionic mobility of ions in pore fluid
 - b) metallic mineral content
 - c) surface area of mineral grains
 - d) all of the above
- 48) The IP phenomenon develops when the induced current:
- a) switched on
 - b) switched off
 - c) a and b
 - d) none of the above
- 49) The IP effect is controlled by the following except:
- a) ionic mobility
 - b) surface area
 - c) surface charge density
 - d) radioactivity
- 50) The largest IP effect associated with the source of:
- a) membrane polarization
 - b) electrode polarization
 - c) ion selective membrane polarization
 - d) electrolytic polarization

=====Best wishes =====

End of questions

Good luck.....

Instructor: Prof. Dr. Gamal Zidan Abdelaal



Final Examination- G319 (II- Chemostratigraphy)

Date: March, 8 , 2021

Time allowed: one hour

Total Marks (25 marks)

Examiner: Prof. Dr. Mamdouh F. Soliman

الامتحان في ثلاث صفحات

Select or write the correct answer for the following : (25 marks, one mark for each)

1- They are generally rocky objects Found In the earth's atmosphere

- A. Comets
- B. Asteroids
- C. Meteors

2-The main asteroid belt exists between the orbits of

- A. Jupiter and Saturn
- B. Mars and Jupiter
- C. Mars and Earth

3- Which of these elements are chalcophiles?

- A. S, Cu, Cr, Co, Zn, As
- B. Ti, Zr, Si, Mg, Na, REE,
- C. Ir, Ni, Pt, Au, Ag

4- In the Earth's crust, the following elements are usually minor elements:

- A. SiO_2 - Al_2O_3 , MgO , CaO
- B. TiO_2 , MnO , P_2O_5
- C. CuO , NiO , ZnO ,

5- Which one of the following is NOT typical of "lithophile elements"

- A. They are silicates
- B. They are carbonates
- C. They are sulfides

6- Acid water with pH 0-7 possesses a

- A. Strong decomposition action
- B. Decomposition rate depends on the difference between the pH of the solution and the pH of the pure water.
- C. Rather weak decomposition action

7- In the hydrolyses of the K-Feldspar, the normal product is:

- A. Bicarbonate
- B- Carbonate
- C- Silicate

- 8- Distal ejecta are those ejecta that occur at considerable distances from the source crater
- A. > 5 crater radii from the crater rim
 - B. < 5 crater radii from the crater rim
 - C. = 3 crater radii from the crater rim
- 9- Evidence of shock metamorphism at the K/T boundary are the existence of the following shocked minerals Except:
- A. Quartz
 - B- Zircon
 - C- Chromite
- 10- Diamond was found at the K/T boundary as:
- A- Nanometer-sized diamonds
 - B- Micrometer-sized diamonds
 - C- Millimeter-sized diamond
- 11- The increase of the detrital elements (Al, Si, Ti and Zr) within sediments is resulted mainly from
- A. Diagenesis
 - B- Oxidation
 - C- Weathering
- 12- Which one of the following is NOT typical of " K/T event"
- Spinels at the K/T boundary are
- A. Highly oxidized (high Fe^{3+} content)
 - B- High Ni (and Co) contents
 - C- High Cr and Ti abundances.
- 13- Increased Ti concentrations relative to Al would reflect
- A. Relative sea-level rise
 - B- Relative sea-level fall
 - C- Input of acidic volcanic rocks
- 14- Detrital components are
- A. Un-resistance materials which remain in situ or transported to other sites with chemical changes
 - B. Transported as solid particles
 - C. Un-resistance to chemical weathering
- 15- Which one of the following is NOT typical of "Laterites"
- A. They developed on aluminum- rich rocks (syenite and nepheline syenite, granite, gneisses)
 - B. They developed on Fe- rich rocks (Basal and gabbros)
 - C. The ferric oxides, H_2O , SiO_2 , TiO_2 are usually present
- 16- During usual diagenetic processes (either involving meteoric water or pore water of marine origin, and proceeding at increasing temperature) the temperatures calculated for diagenetically altered rocks are
- A. Usually lower than real depositional temperatures
 - B. Usually higher than real depositional temperatures
 - C. usually the same as the real depositional temperatures

- 17- During precipitation, the vapor which is more enriched in ^{16}O condensates
 A. Along the coastal areas
 B- Inside the continent
 C- Along the mid ocean
- 18- The Paleocene-Eocene Thermal Maximum (PETM) at Gabal Dababiya section (GSSP section) is characterized by:
 A. Low $\delta^{18}\text{O}$ values
 B- High $\delta^{18}\text{O}$ values
 C- High $\delta^{13}\text{C}$ values
- 19- Pelagic forams have moreincorporated in their shells than the benthic forams.
 A. ^{18}O and ^{13}C B. ^{16}O and ^{13}C C. ^{16}O and ^{12}C
- 20- $\delta^{18}\text{O}$ value of CaCO_3 decreases during winter because of the increase of ^{16}O in ocean water.
 A. (True) B. (False)
- 21- During usual diagenetic processes (either involving meteoric water or pore water of marine origin, and proceeding at increasing temperature) the $\delta^{18}\text{O}$ values of limestone typically increase
 A. (True) B. (False)
- 22- Most accurate records of oxygen and carbon isotope stratigraphies are based on carbonates of the bulk samples .
 A. (True) B. (False)
- 23- The marine organic matter (very -ve $\delta^{13}\text{C}$) is dominantly remove from the DIC in surface waters but is commonly re-oxidized and the light C returned to the DIC, after the death of the organisms in deeper water and on sea floor.
 A. (True) B. (False)
- 24- Ferrous carbonate is stable against chemical weathering
 A. (True) B. (False)
- 25- Fe_2O_3 is readily soluble during weathering
 A. (True) B. (False)

انتهت الأسئلة
 مع أطيب الأمنيات بالتوفيق - أ.د. / ممدوح فراج سليمان



PRINCIPALS OF STRUCTURAL GEOLOGY

(50 marks)

ANSWER THE FOLLOWING QUESTIONS:

I. Choose the correct answer for the following statements

1. What behaviors are typical of rocks that are deeply buried?

- a. Brittle and elastic.
- b. Ductile and elastic.
- c. Ductile and plastic.

2. What behaviors are typical of rocks at or near the earth's surface?

- a. Brittle and elastic.
- b. Brittle and plastic.
- c. Ductile and elastic.

3. Which type of deformation of the earth's crust is reversible?

- a. Elastic deformation.
- b. Plastic deformation.
- c. Brittle deformation.

4. What term refers to line made by the intersection between bedding plane and a horizontal plane?

- a. Dip.
- b. Plunge.
- c. Strike.

5. Which features are characteristic of anticlines?

- a. Dip symbols pointing away from axis and oldest rock in the middle.
- b. Dip symbols pointing away from axis and youngest rock in the middle.
- c. Dip symbols pointing toward axis and oldest rock in the middle.

6. Which features are characteristic of synclines?

- a. Dip symbols pointing away from axis and youngest rock in the middle.
- b. Dip symbols pointing toward axis and oldest rock in the middle.
- c. Dip symbols pointing toward axis and youngest rock in the middle.

7. Which features tend to develop from shear stress?

- a. Anticlines.
- b. Reverse faults.
- c. Strike-slip faults.

8. Which features often form with no vertical displacement of rock?

- a. Normal faults.
- b. Reverse faults.
- c. Strike-slip faults.

9. What are the cause and effect of movement along a reverse fault?

- a. Lengthening of the crust due to compression.
- b. Shortening of the crust due to compression.
- c. Shortening of the crust due to tension.

10. What name is given to the block of rock above a fault?
- Foot wall.
 - Hanging wall.
 - Scarp.
11. In what type of fault does the hanging wall move down relative to the foot wall?
- Normal fault.
 - Reverse fault.
 - Thrust fault.
12. What name is given to crack in the rock along which no movement has taken place?
- Horst.
 - Joint.
 - Scarp.
13. What name is given to a block that has been down-dropped by normal faulting?
- Graben.
 - Horst.
 - Scarp.
14. What feature is left at the surface by displacement along a fault?
- Graben.
 - Horst.
 - Scarp.
15. A fold in which the axial plane is parallel to the surface of the Earth is a(n):
- overturned fold.
 - recumbent fold.
 - plunging fold.
16. A fold in which the axis intersects the Earth's surface is known as a (n):
- overturned fold.
 - recumbent fold.
 - plunging fold.
17. Vertical displacement occurs in all of the following EXCEPT:
- strike-slip faults.
 - thrust faults.
 - normal faults.
18. A thrust fault is the result of:
- Tensional stress and the hanging wall moves up relative to the footwall.
 - Compressional stress and the hanging wall move down relative to the footwall.
 - Compressional stress and the hanging wall moves up relative to the footwall.
19. How is "brittle" deformation different from "ductile" deformation?
- Brittle deformation occurs in rocks that are hotter, whereas brittle deformation occurs at low temperature where energy is lower.
 - Brittle deformation occurs in rocks that are colder, whereas ductile deformation occurs at high temperature where energy is higher.
 - Brittle deformation causes rocks to be transported on faults and folds, whereas ductile deformation involves elastic and recoverable strain only.
20. A fold in which the axial plane is horizontal with the surface of the Earth is a (n):
- overturned fold
 - recumbent fold
 - plunging fold

21. Which of the following pairs of statements about anticlines and synclines are both true?
- In anticlines, the oldest rocks are in the center; in synclines, the youngest rocks are in the center.
 - An anticline is present wherever there is a hill; a syncline is present wherever there is a valley.
 - Anticlines are a result of plastic deformation, whereas synclines are a result of elastic deformation.
22. The difference between elastic deformation and plastic deformation of rocks is that plastic deformation (is)
- Permanently alters the shape of a rock layer.
 - Always occurs just before a rock layer breaks.
 - Returns to its original shape after the pressure are removed.
23. Rock units recover their original shape after the stress is released in folding.
- Fracture strain.
 - Plastic strain.
 - Elastic strain.
24. The hardest type of unconformity to recognize in the field is:
- Paraconformity.
 - Disconformity.
 - Nonconformity.
- 25- Drag folds Occur:
- Within the competent beds.
 - Within the incompetent beds are overlain by competent beds.
 - When vertical stresses act on horizontal beds.
- 26- When the rocks cool, they contract, and the hexagonal shape is a result of this contraction
- Mud cracks.
 - Columnar joints.
 - Dykes.
27. A fold in rock layers that makes a trough is called a (an)
- Normal cline.
 - Syncline.
 - Anticline.
28. Folding occurs when rocks behave as
- Brittle solids.
 - Fluids.
 - Ductile solids.
29. Anticlines:
- Form in rocks as a result of brittle deformation.
 - Are upwarped folds.
 - Are downwarped folds.
30. In a syncline, the oldest rocks will be found:
- On the limbs of the fold.
 - Near the axis of the fold.
 - at the bottom of the fold
31. In a syncline, all rock layers:
- dip toward the fold axis.
 - dip away from the fold axis.
 - have vertical dips.

32. Folds whose limbs are horizontal are known as:

- a. horizontal layers.
- b. overturned folds.
- c. recumbent folds.

33. Which of the following is not a fold type?

- a. Syncline.
- b. Dome.
- c. Thrust fault.

34. The two sides of a fold are called its.

- a. Synclines
- b. limbs
- c. axial planes

35. An overturned fold is characterized by.

- a. two limbs dipping in the same direction - with one tilted beyond vertical
- b. two limbs dipping in opposite directions
- c. two limbs not parallel to each other

II- True or False? Circle the correct answer.

36. The general term for the change in shape of a rock when sufficient stress is applied is strain.

True or False

37. A rock that undergoes sufficient stress to change its original shape has exceeded its elastic limit.

True or False

38. Rocks in which plastic deformation occurs remain in their deformed shape when the stress is released.

True or False

39. Brittle failure is more likely to occur if stress is applied slowly rather than suddenly.

True or False

40. Plastic deformation is likely to occur in rocks under high-temperature and high-pressure conditions.

True or False

41. Strike-slip faults have primarily horizontal movement.

True or False

42. Anticlines and synclines are caused by directed compressive stress.

True or False

43. In eroded anticlines, the oldest rocks are in the center; in eroded synclines, the youngest rocks are in the center.

True or False

44. In plunging folds, the nose of the fold points in the direction of plunge in an anticline, and opposite the plunge direction in a syncline.

True or False

45. A series of parallel anticlinal folds on a regional-scale anticline is called an anticlinorium.

True or False

46. Folds result from brittle deformation of rocks.

True or False

47. In a plunging syncline, the structure opens in the direction of plunge

True or False

48. In an anticline, the hanging wall moves upward relative to the footwall.

True or False

49. Stress and strain are the same thing.

True or False

50. The difference between a joint and a fault is the fault is larger.

True or False

GOOD LUCK

Pro. Dr. Ahmed R. El Younsy

7 March 2021



كلية العلوم-قسم الجيولوجيا



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

الزمن : ٣ ساعات

الدرجة الكلية (٦٠ درجة)

يناير ٢٠٢١

PART I: ROCK MECHANICS (16 marks)

1- What are the differences between the following items?
(Answer Four only; (12 Marks):

- 1- Confining (lithostatic, hydrostatic) pressure and Directed pressure.
- 2- Volumetric Strain, Angular strain and Longitudinal strain
- 3- Plastic strain and Elastic strain.
- 4- Homogeneous strain and Non Homogeneous strain.
- 5- Body forces and Surface forces.
- 6- Brittle substances and Ductile substances

2- Discuss how the mechanical behavior of rocks is controlled by confining pressure
(4 Marks).

PART II: STRUCTURAL GEOLOGY (34 marks)

ANSWER THE FOLLOWING QUESTIONS:

Try to Illustrate your answers with suitable drawings when possible

- I. Choose the correct answer for Four of the following statements, and then rewrite in your answer paper** (4 MARKS)
1.is a term used to indicate the direction of movement and rotation that occurred during deformation (1 mark)
Vergence - Simple shear - Rake - Enveloping surface
 2. 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.

3. The angle between fold limbs in the profile plane is called the (1 mark)
interlimb angle - *true dip angle* - *vergence angle*
4. In faulting, the horizontal component of dip separation is called..... (1 mark)
Throw - *Heave* - *dip slip*
5. A non- cylindrical fold is characterized by (1 mark)
curved hinge line - *straight hinge line* - *refolded hinge line*

ANSWER ONLY FOUR OF THE FOLLOWING QUESTIONS: (30 Marks)

- II. Define and illustrate by drawings: (7.5 marks)
Overtured folds - *Monoclines* - *Listric faults* -
Chevron fold - *Pull-apart basin*
- III- Write short notes on field criteria of faults . (7.5 marks)
- IV- Write on the fold classification based on the orientation of the hinge line and the axial surface. (7.5 marks)
- V- Compare between similar folds and parallel folds (7.5 marks)
- VI- Explain how folds may develop as an indirect result of shearing stress. (7.5 marks)

Oral Exam(10 marks)

1. Define the following items (Answer two only; 5 Marks):
Stress ellipsoid - *Finite strain* - *Torsion* - *Normal Stress*
2. Define the following structures (Answer two only; 5 Marks):
Ptygmatic folds - *Nonconformity* - *Doubly plunging anticline*

GOOD LUCK

Prof. Dr. Moustafa M. Youssef

Dr. Hassan Sayed Abbas

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- Grey wacke
(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. What are the four main types of allochems common in carbonate rocks?
(5 Marks)
5. Describe briefly the texture and composition of:
Oosparite
Pelsparite
Biomicrite
(5 Marks)

أ.د. محمد أحمد سليمان

Part Two: Sedimentary environments and facies (25 marks)

Choose the correct answer (One mark for each questions):

1. In which type of environment would you be most likely to observe wind erosion.....
 - a. a high mountain
 - b. a hot desert
 - c. a rocky sea shore

2. The depositional feature that forms where a stream emerges from a mountainous region onto a plain is called.....
 - a. alluvial fan
 - b. natural levee
 - c. delta

3. If sea-level drops or the land rises, what is likely to occur
 - a. a regression
 - b. a transgression
 - c. decrease in the value of shorefront property

4. Large dune fields, or seas of sands, are called.....
 - a. draas
 - b. regs
 - d. ergs

5. The term aeolian refers to.....
 - a. stream-related processes.
 - b. glacial processes in areas outside the polar regions.
 - c. erosion, transportation, and deposition by the wind.

6. Which of the following environments is an example of a shoreline/transitional environment.....
 - a. alluvial
 - b. continental shelf
 - c. deltaic

7. Which of the following sedimentary environments is characterized by sand, gravel and mud.....
 - a. active margin beach
 - b. alluvial fans
 - c. glacial
 - d. deep marine

8. Oozes are associated with.....
- a. volcanic deposits
 - b. terrigenous deposits
 - c. pelagic deposits
9. Sedimentary facies is a term used to describe an association of sedimentary rocks that all formed.....
- a. at the same time but in different depositional environments
 - b. from the same source rock but at different times in Earth history
 - c. in the same depositional environment but at different times in Earth history
10. How do we use composition and textures of sedimentary rocks as a record of the "environment" of sediment deposition.....
- a. comparison with areas of modern (today) depositional environments (e.g., beaches)
 - b. comparison with areas of ancient (long past) depositional environments (e.g., ancient beaches)
 - c. comparison with areas of modern (today) erosional environments (e.g., mountain tops)
11. Point bar sediments on meandering rivers are characterized by.....
- a. high content of coal.
 - b. a mixture of gravel, sand and clay.
 - c. cross bedding and fining upward gradation in grain size.
12. The sediments of a delta in any stratigraphic sequence are detected by.....
- a. volcanoclastic grains.
 - b. coarsening upward sequences, sometimes in repeated cycles.
 - c. fining upward sequences with continental fossil remains.
13. Which of the following may be indicative of sediment deposition in a non-marine terrestrial environment.....
- a. red colored sediments and traces of plant roots
 - b. calcareous ooze
 - c. manganese nodules and crusts.

True or false (One mark for each questions):

1. The lateral migration of a meandering channel erodes the inner convex bank, scours the river bed, and deposits sediment on the outer concave bank as point bar deposits consisting primarily of massive sandstones.

- a. True
- b. False

2. Sedimentary environment is a geographic location under which sediment can accumulate and characterized by a particular combination of geological processes and environmental conditions.

- a. True
- b. False

3. Braided channels are normally associated with low-gradient slopes, coarse, often gravelly, sediment, and steady discharge. Meandering channels are normally associated with fine-grained sediment, steep gradient and erratic discharge.

- a. True
- b. False

4. Environments of equilibrium are surfaces of the earth, only under the sea, which for long periods of time are sites of erosion and deposition.

- a. True
- b. False

5. The geometry is the two-dimensional shape of a sedimentary environment, which is a function of syn-depositional topography, the geomorphology of the depositional environment and its post-depositional history.

- a. True
- b. False

6. By reconstructing depositional environments geologists are able to reconstruct the climates of the past, life forms of the past and geography of the past-where the mountains, basins, large rivers and bays of the ocean were.

- a. True
- b. False

7. Thick sequences of red-colored interbedded conglomerates, sands, and shales devoid of marine fossils and showing fining upward are generally believed to be deltaic in origin.

- a. True
- b. False

8. Calcareous oozes are well-developed in Polar Regions. This is due to the low temperature of the bottom water which causes the accumulation of aragonite and calcite at faster rates than in the more equable equatorial oceans.

- a. True
- b. False

9. Fossils are the most useful tools in paleoenvironmental reconstructions. However their applications are highly limited in Precambrian rocks.

- a. True
- b. False

10. Fining upward sequence means that the grain size is decreasing upward, whereas coarsening upward means that the grain size is increasing upward.

- a. True
- b. False

11. To use fossils as paleoenvironmental indicators, they should be in-situ and not reworked

- a. True
- b. False

12. Beaches, tidal-flats, spits, bars, barrier islands, lagoons, estuaries, and deltas all form in the transitional environment.

- a. True
- b. False

Good Luck

Abdalla M. El Ayyat

بسم الله الرحمن الرحيم

جامعة أسيوط
كلية العلوم
قسم الجيولوجيا

Assiut University
Faculty of science
Geology Department

إمتحان المستوى الرابع (شعبتي الجيولوجيا والجيوفيزياء)

مقرر 415 ج (جيولوجية مصر)

Course 415 G (Geology of Egypt)

الزمن : ثلاث ساعات

الدرجة: 50 درجة

دور يناير 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):

Summarize the successive stages illustrating the tectonic evolution of the Precambrian basement of the Arabian-Nubian Shield. (10 marks)

Question 1- B:

Compare and contrast between the lithological sequence of the Hafafit domal structure and that of Gebel Uweinat. (10 marks)

Part II (Phanerozoic) 30 Marks

Answer Only TWO Questions of the following:

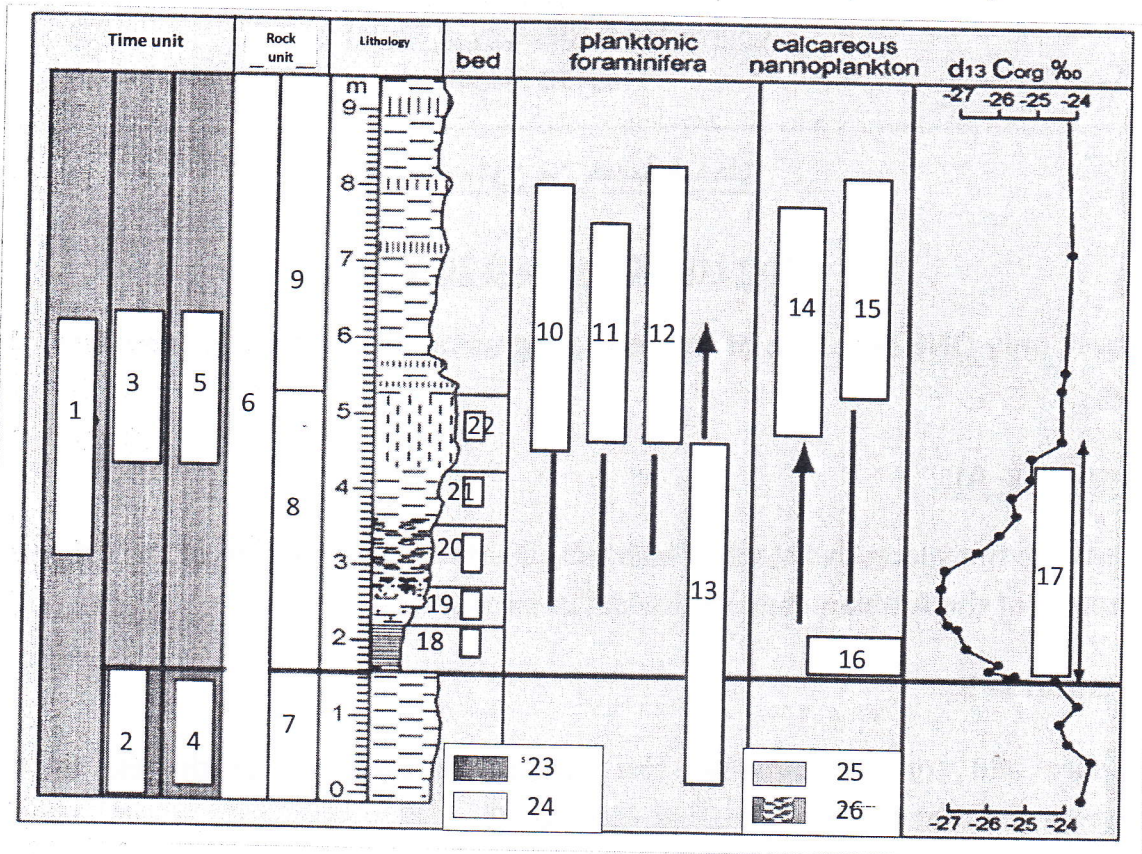
Question 2 (A and B): 15 Marks

2-A: Compare and correlate in a time table the Carboniferous rock units along both sides of the Gulf of Suez (7.5 Marks)

2-B: Identify in a time table the different rock units of the Miocene Series in the Gulf of Suez and their equivalent time units (7.5 Marks)

Question 3(A and B): (15 Marks)

3-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. (10 Marks)



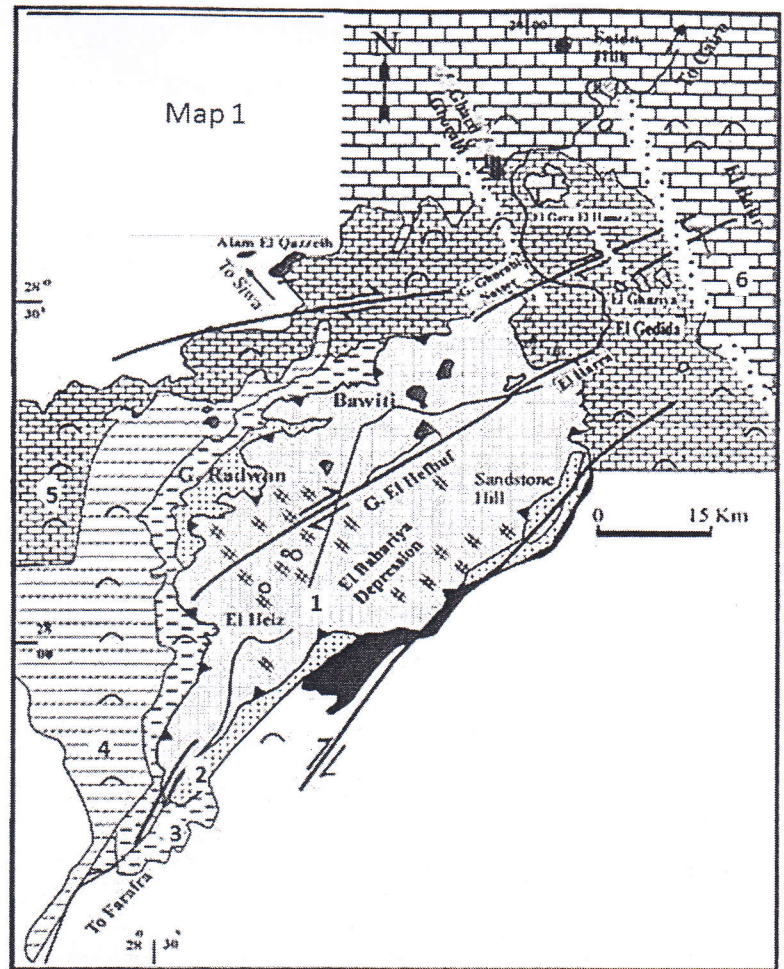
3- B: Mark the correct word from the three words in the brackets (5 Marks)

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 4(A and B): (15 Marks)

4-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.



4-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. (10 Marks)

List I

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

List II

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

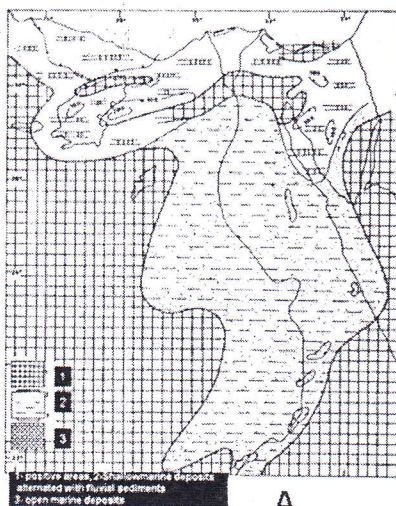
Part III (Structural Framework, Paleogeography and Paleoenvironment)
(10 Marks)

Question 5 (A, B and C)

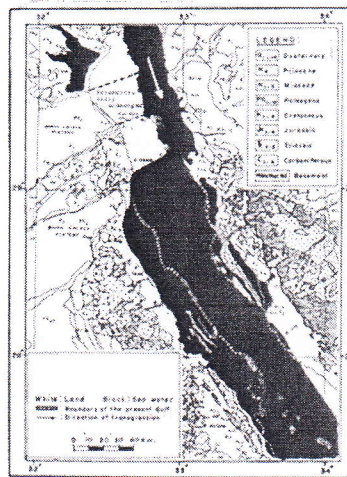
6-A: Answer ONLY ONE question of the following: (3.5 Marks)

- a) Compare between island arc metavolcanics and the Dokhan volcanics. (3.5 Marks)
- b) Write short notes on the Fawkhier ophiolites. (3.5 Marks)

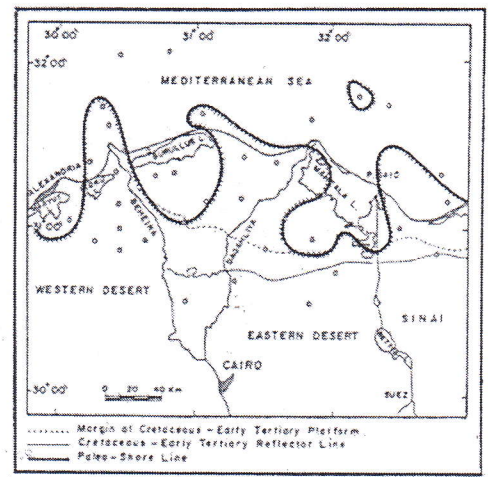
6-B: Look to the following paleogeographic maps and define the Period, Epoch and Absolute age during which the Egyptian land was submerged in a way such as in figures A, B, C, D and E. (2.5 Marks)



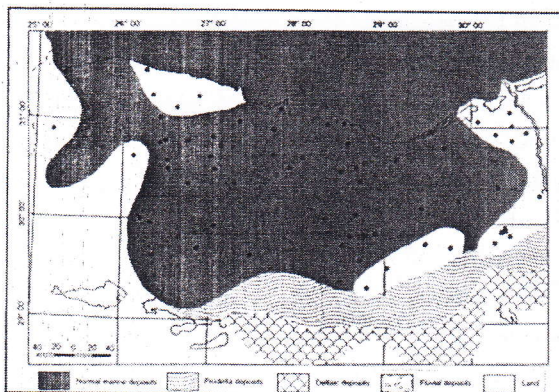
A



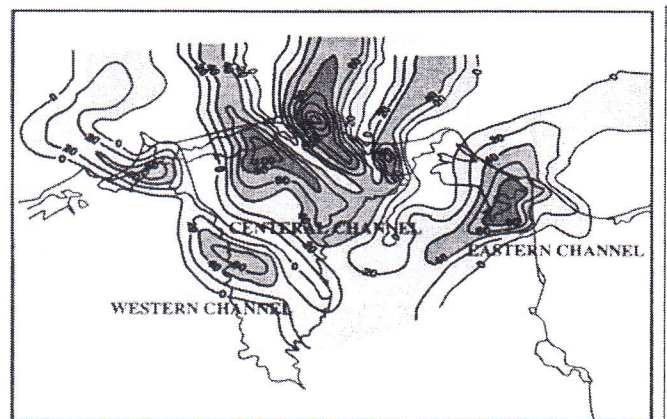
B



C

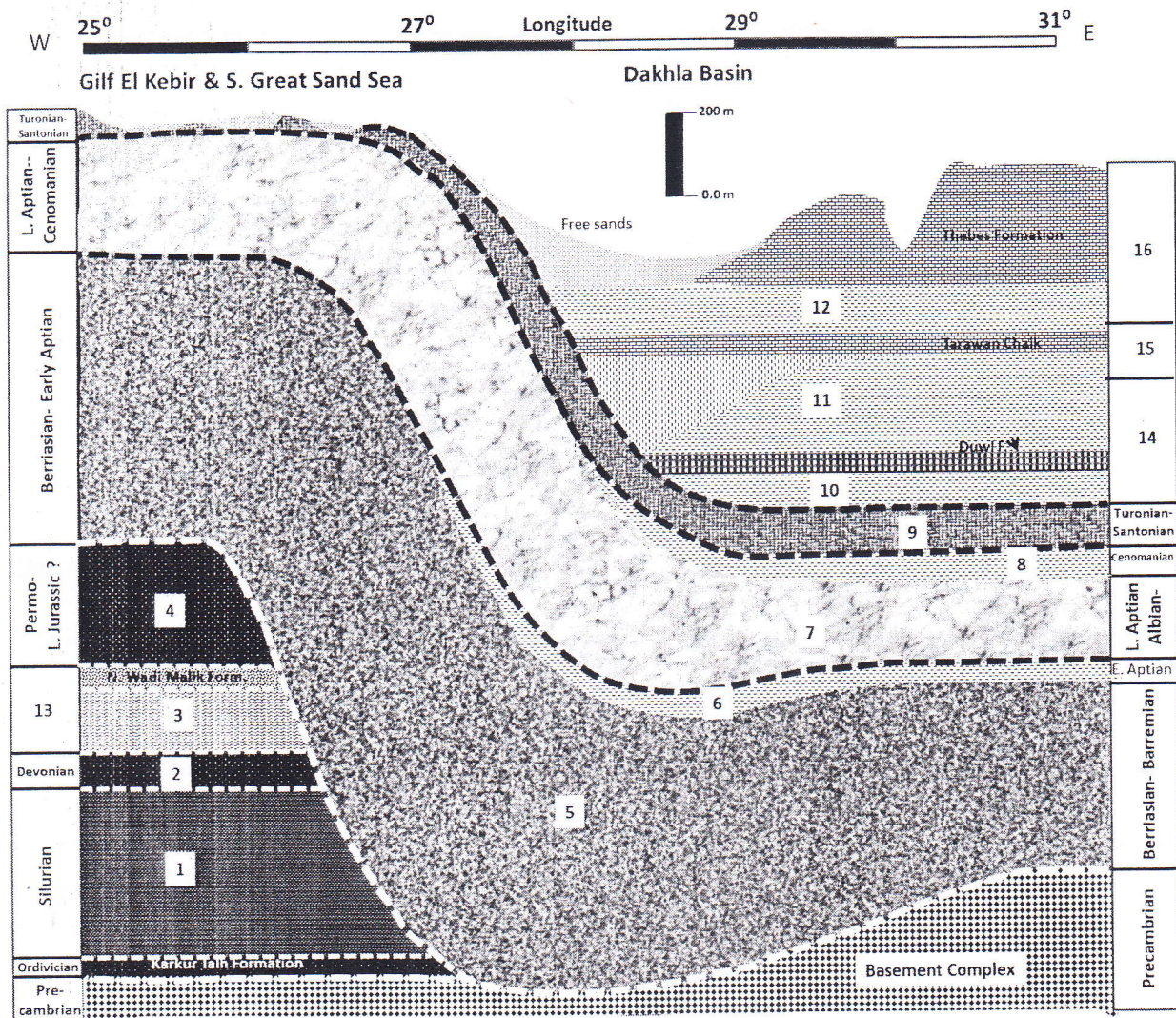


D

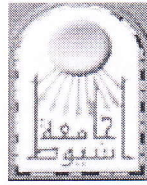


E

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)



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



Frist Semester Final Examination

Subject: Subsurface Geology (G409)
Student: Fourth level (all groups).

Total marks 50

Answer the following questions

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

1. Local sources of subsurface data are generally include surface and subsurface sources. The surface sources such as borehole temperature, porosity and permeability of the reservoir rocks.
2. The subsurface sources of data are such as cores, cuts and logs
3. In structure contour map, normal faults of downthrown more than the thickness of the faulted bed, the contour lines at the location of the fault plane show reputation of contours.
4. In isopach map, reverse fault of downthrown more than the thickness of the faulted beds, the contour lines show fault gap.
5. The erosional surfaces between two rock units can defined from the isopach maps of the two units by alternative thick in the lower unit opposite thin in the upper unit.
- 6- The main objectives of subsurface sectioning and mapping are mainly industry.
- 7- The reference surface in constructing structure cross section and structure contour map is the main sea level.
- 8- The reference surface in constructing geoelectric and geosiesmic cross sections is the bedding plane.
- 9- In normal cross sections or fence diagrams the vertical scale is similar to the horizontal.
- 10- In case of construction structure contour map for any bedding plane, this plane may be eroded or truncated.
- 11- Structure contour maps can show the tectonic history of many tectonic phases.
- 12- Structure contour maps can show the parameters of the fault planes.
- 13- Paleogeologic maps can used in reservoir evaluation.
- 14- For studying the paleotectonics, structure contour maps are used in conjunction with palinospastic maps.
- 15- Radio maps are constructed to show ratio of one component to the total components of the rock unit.
- 16- Percentage maps are generally applied in defining the paleoenvironment.
- 17- Isopach maps are constructed by using the drilled thickness of the rock unit.
- 18- Isolith maps are constructed to show the aerial distribution of the sedimentary facies.
- 19- Isochore maps are constructed based on the true thickness of the rock unit.
- 20- Folding on the structure contour maps is identified by repetition of contour line along definite direction.
- 21- Nosing in contours with acute angle on the structure contour maps pointing to strike slip faults.

- 22- Missing of contours in a definite location on structure contour maps indicates normal fault of downthrow more the thickness of the faulted bed.
- 23- Regular oval contour lines in isopach map of definite rock unit indicating to shelf area.
- 24- Random contours in isopach map of definite rock unit indicating to intercratonic area.
- 25- Reverse faults with different downthrows are easily detected from structure contour map alone.
- 26- Isolith with isopach maps are generally used in defining the erosional surfaces.
- 27- Fence diagrams are considered 3D models
- 28- Fence diagrams are considered 3D viewer.
- 29- Symmetrical folds in case of structure contour maps are identified by un-equal contour spacing of the repeated contours along definite direction.
- 30- The general outlines of the salt domes can identified from isopach maps of the successive rock units outside the dome periphery.
- 31- Isopach maps are more accurate than structure contour maps in defining structures especially faults.
- 32- Paleorelief maps are considered structure contour maps for unconformity surfaces.
- 33- For studying the geologic and tectonic history of Egypt isopach and facies maps are constructed for the Egyptian sequence from the basement rocks to the Thebes formation
- 34- Offlap and onlap phenomena's are recognized from isopach map of one rock unite.
- 35- In isolith maps contours closed rapidly to zero indicate truncation.

II- Choose the correct answer A, B or C of the following (0.5 mark each)

- 36- Offlap phenomena in subsurface can be recognized from successive isopach maps by:
 - a- Upward regular migration of zero thickness toward the recent layers
 - b- Upward regular migration of zero thickness toward the old layers
 - c- Upward irregular migration of zero thickness toward the recent layers
- 37- Concordance in contours of ratio, percentage, isolith and isopach maps for different facies of rock unit indicates to:-
 - a- Regular sedimentation
 - b- Discontinuities in sedimentation
 - c- Migration of strand line
- 38- The salt-dome morphology and the related petroleum traps can be recognized and evaluated from:-
 - a- Isopach maps
 - b- Structure contour maps
 - c- Both a & b
- 39- Beds attitudes (strike & dip) and fault parameters can be determined from
 - a- subsurface stratigraphic cross section
 - b- Subsurface normal structural cross section
 - c- Subsurface schematic cross section
- 40- In log correlation for structures identification, the correlation must look for:-

- a- Missing of one or more layers in some logs
 - b- Thinning or thickening of layers in some logs
 - c- Both a & b
- 41- Drilling horizontal layers by directional drilling TMT is increasing with:-
- a- Decreasing of deviation angle
 - b- Increasing of deviation angle
 - c- Increasing of dip angle
- 42- In isopach map, abrupt increasing of contours in the upthrow side of the fault plane in compared with in the downthrown side indicating to:-
- a- Normal growth faults
 - b- Reverse growth faults
 - c- Wrench growth faults
- 43- Repetition of layers during vertical drilling without definite changing in the repetition interval along the section in different wells indicts to:-
- a- Reverse fault
 - b- normal fault
 - c- recumbent fold
- 44- For tracing the subsurface structures along definite direction, the collected subsurface depth to the bedding planes must be referred to:
- a- Non- eroded bedding plane.
 - b- Main sea level
 - c- Unconformity surface
- 45- Geochemical cross sections and fence diagrams are applied to:-
- a- Detect subsurface structures
 - b- Detect the subsurface environments
 - c- Lateral and vertical chemical variations of the rock components
- 46- 3D geologic model is generally constructed by :-
- a- Correlating the similar rock units along more than one horizontal direction.
 - b- Importing the subsurface geology data into specialized software.
 - c- Looking for missing rock units along the used Wells.
- 47- Data derived from well sampling are:-
- a- Cores and cuts
 - b- Porosity and permeability
 - c- Rock seismic velocities
- 48- Data derived from well measurements are:-
- a- Cores and cuts
 - b- Rock seismic velocities, resistivity and saturation
 - c- Topographic maps
- 49- Subsurface mapping is applied for:-
- a- Academic purposes
 - b- Industry purposes
 - c- Both a&b

- 50-Reverse fault of downthrown more than thickness of the down- faulted beds can be recognized from structure contour map by:
- a- Presence of fault gap
 - b- Repetition of contour lines within the fault zone area
 - c- Repetition of only one or two contours in a very narrow area
- 51- Nosing in the structure contour map with centre- ward decreasing of contour values and similar contour distance in both sides denoting to:
- a- Asymmetric plunging syncline
 - b- Symmetrical plunging anticline
 - c- Symmetrical double plunging syncline
- 52- Wrench Faults of horizontal displacement can be recognized on structure contour map by:
- a- Nosing of the contour lines
 - b- Pending of the contour lines
 - c- Repetition of the contour lines
- 53- Nosing in the structure contour map with centre- ward increasing of contour values and similar contour distance in both sides denoting to:
- a- Asymmetric plunging anticline
 - b- Symmetrical plunging syncline
 - c- Symmetrical double plunging syncline
- 54- Intersection and irregularity in contours of ratio, percentage, isolith and isopach maps of time rock unit indicate to:-
- a- Regular sedimentation
 - b- Erosion
 - c- Migration of strand line
- 55- Syn-sedimentary subsidence in subsurface can be recognized by:
- a- Migration of maximum thickness of the subsurface layers toward the shore line
 - b- Fixing of the maximum thickness of the subsurface layers in the depo-centre of the basin
 - c- Migration of the maximum thickness of the subsurface layers toward the depo-centre of the basin
- 56- Uplift phenomena in subsurface can be recognized from preparing successive isopach maps of conformable rock units by:
- a- Upward regular migration of zero thickness toward the recent layers
 - b- Upward regular migration of zero thickness toward the old layers
 - c- Upward irregular migration of zero thickness toward the recent layers
- 57- Vertical drilling of horizontal layers, the drilled thickness is:-
- a- More than the true thickness of the drilled layers
 - b- Less than the true thickness of the drilled layers
 - c- Equal to the true thickness of the drilled layers
- 58-Directional drilling of horizontal layers, the drilled thickness is:-
- a- More than the true thickness of the drilled layers
 - b- Less than the true thickness of the drilled layers
 - c- Equal to the true thickness of the drilled layers
- 59-Bed and fault attitude can directly measure from:-

- a- Structure cross section
- b- Normal structure cross section
- c- Geophysical cross section

60-Convergence of zero thickness in isopach maps of successive rock units in the same location indication to:-

- a- Strand line
- b- Depocenter of the basin
- c- Onlap phenomena

61-Ratio, percentage and lithofacies maps are considered:-

- a- Isopach maps
- b- Facies maps
- c- Structure contour maps

62-Contour distance in structure contour map depends on:-

- a- Depth of the mapped surface
- b- Dip of the mapped surface
- c- Truncation of the mapped surface

63-Regional isopach map is prepared to show:-

- a- The paleoenvironment of member within the subsurface stratigraphic unit
- b- The paleoenvironment of the subsurface stratigraphic unit
- c- The local structures that affecting on the subsurface stratigraphic unit

64-The most accurate data used in subsurface sectioning and mapping are that given from:-

- a- Core samples
- b- Cut samples
- c- Well logging

65-Paleotectonic maps are generally prepared to study:-

- a- Tectonic phases allow over the tectonic history of an area
- b- The last tectonic acting in the area
- c- The tectonics which were act in a definite geologic age

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

Time: Two Hours (50 degree) 24- Jan., 2021

PART-I: Sedimentary Basins (25 degree)

Answer the following questions:

- 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? (4 marks)

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 (4 marks)

PART-II: Sequence Stratigraphy (25 degree)

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

A). Write a brief article on the following question: (7marks)

1. Describe 1st, 2nd, 3rd, 4th and 5th order relative sea level cycles in terms of the time periods over which they operate and the possible causative mechanisms

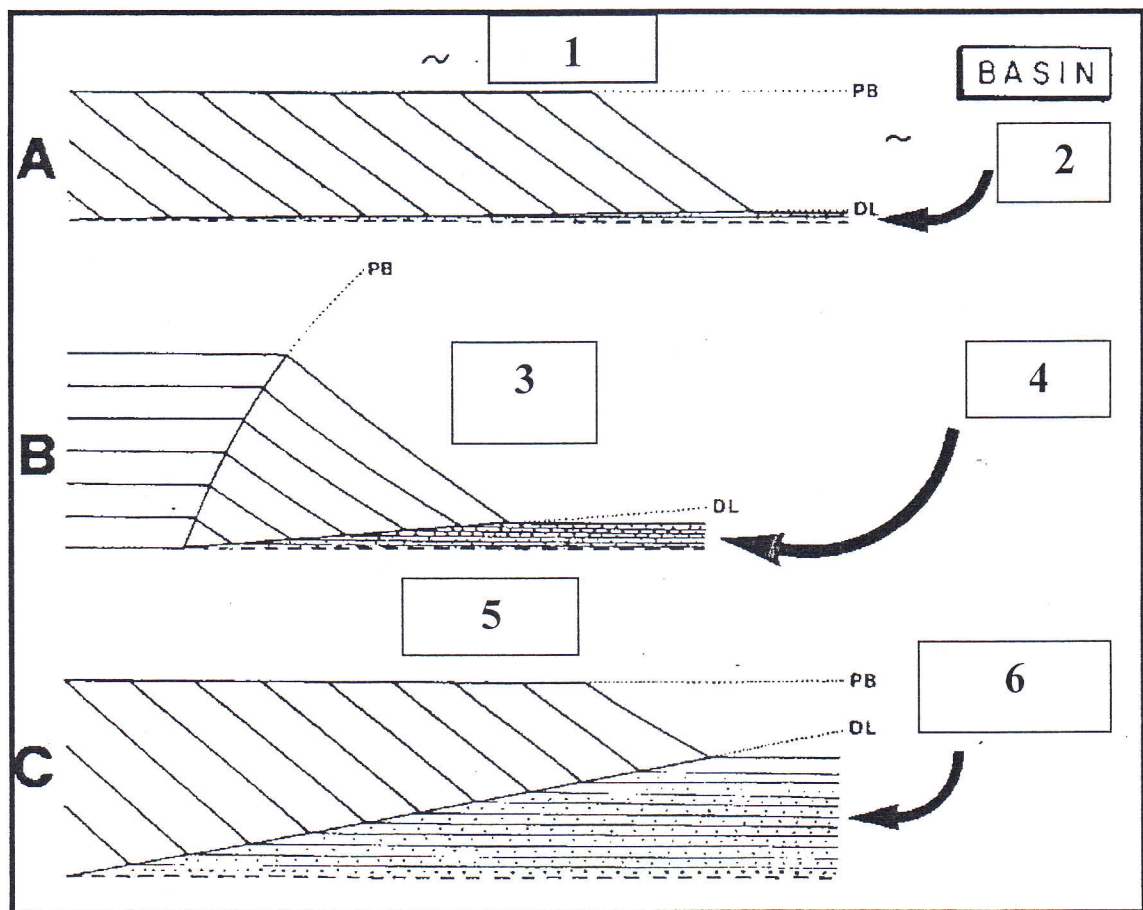
B). Write on, and differentiate between TWO ONLY of the following: (6marks)

2. What is a parasequence and how are the bounding surfaces recognized? And how does the vertical stacking pattern of parasequences allow for the recognition of systems tracts?
3. The criteria of recognition of sequence boundaries.
4. The difference between retrogradational and progradational stratal pattern in response to sea level changes and sediment flux.

C). 4- Provide short definitions of THREE terms of the following and explain why they are important in sequence stratigraphy: (6 marks)

- | | |
|---|---------------------------------|
| a) Type 1 and Type 2 sequence boundary. | b) Marine Flooding Surface. |
| c) Base level. | d) Transgressive Systems Tract. |

D). 5 – Discuss the relationship between platform break plane and downlap plane that can be used to understand the depth evolution of a basin, and recognize the different situations given in the following figure below at squares 1,2,3,4,5and 6. (6marks)



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

Prof. Dr. Mohamed Ahmed Soliman

Prof. Dr. Ahmed-Reda El Younsy

24- Jan., 2021

Total Marks (50)

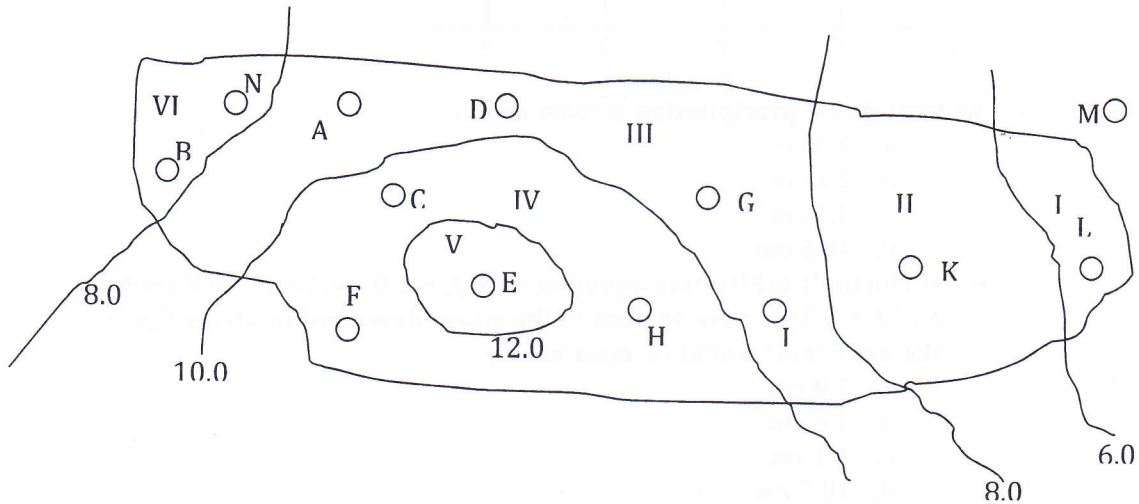
Q1. (10 marks) A small catchment of area 150 hectare (1 ha.= 10000 m²) received a rainfall of 7.0 cm/hr in 90 min duration due to a storm. At the outlet of the catchment, the stream draining the catchment has an initially discharge equal to 1.0 m³/sec before the storm. After the beginning of the storm, the stream discharge is increased to 3.0 m³/sec for 10 hr period. The stream has again the same initially discharge after this period. What is the amount of water losses in centimeters? Also, compute the runoff coefficient.

Q2. (10 marks) Point rainfall due to a storm at several rain gauge stations in a basin are shown in Fig. below. Determine the average depth of rainfall over the basin by two methods.

Station	A	B	C	D	E	F	G	H	J	K	L	M	N
Rainfall (cm)	8.8	7.6	10.8	9.2	13.8	10.4	8.5	10.5	9.5	7.8	5.2	5.6	7.4

The areas between the isohyets are as follows in Km²:

I	II	III	IV	V	VI
410	900	2850	1750	720	550

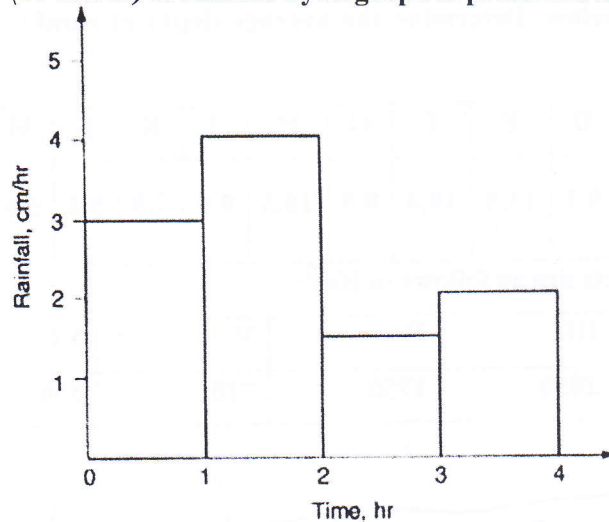


Q3. (10 marks) In a catchments area, the following rainfall data were recorded during an intense storm, what will be the additional number of rain-gauge stations to limit the percentage error of 8% to the measured mean value of rainfall depth.

Station No.	1	2	3	4	5	6	7
Rain depth (cm)	30.1	56.2	42.1	38.6	51.1	32.2	30.7

Q4. (10 marks) The average air temperature for a certain month above a lake surface is 30 °C, actual vapor pressure, e_a , is 23.0 mb and the relative humidity is 60%. The average wind speed as measured at a nearby weather station at 20 meters elevation is 10m/s. estimate the average daily evaporation for the same month (assume $a = 0$ and $b = 0,015$). Where $f(u) = a + b U_{20}$.

Q5. (10 marks) A rainfall hyetograph is presented in the shown Figure.



- The total storm precipitation is most nearly
 - 2.0 cm
 - 2.6 cm
 - 4.1 cm
 - 10.5 cm
- If Horton's infiltration equation with $f_o = 2.0$ cm/hr, $f_c = 0.8$ cm/hr, and $k = 0.5$ /hr were applied to the storm described in above figure, the net runoff would be most nearly
 - 2.0 cm
 - 2.6 cm
 - 4.1 cm
 - 10.5 cm
- If the net runoff from the storm were 4.0 cm, the ϕ -index that correctly describes the infiltrated amount would be nearest to
 - 1.0 cm
 - 1.5 cm
 - 1.7 cm
 - 2.3 cm

With my best wishes
Prof. Dr. Hassan Ibrahim Mohamed

**Fourth Level Examination in
Seismic Sequence stratigraphy (Gp.426)
For Petroleum Geology students**

Time: Two hours

(50 degree)

14, .March, 2021

A) Answer TWO questions ONLY (each question 10 marks):

- 1- How can relative sea level rise and water depth decrease?
- 2- What is the parasequences bounding surface and what its characteristic features?
- 3- Define the difference between Type 1 and Type 2 sequence boundary and how do they form in response to the dominant factors influencing relative sea level?

B) Answer the following THERR questions:

- 4- The criteria of recognition of sequence boundaries.

(6marks)

5 Matching Sentences

(14marks)

i. Marine Flooding Surface	a) Deposited by a relatively slow rise in sea level and the filling of incised valleys.
ii. Incised Valley Fill	b) Marine beds immediately overlying non-marine beds, may contain clasts from underlying unit, may have mixed faunal assemblages
iii. Transgressive Lags	c) A surface that separates younger from older strata, across which there is evidence of an abrupt increase in water depth
iv. Type 1 Sequence is bounded	d) below by a type 1 sequence and above by a type 1 or type 2 sequence boundary
v. Transgressive Systems Tract	e) The lower-most systems tract associated with a type 2 sequence boundary. one or more weakly progradational to aggradational sequence sets
vi. Type 2 Sequence is bounded	f) below by a type 2 sequence boundary and above by a type 1 or type 2 sequence boundary
vii. Shelf Margin Systems Tract	g) The middle systems tract of both type 1 and type 2 sequences. One or more retrogradational parasequence sets.

- 6) a-Write in the three empty boxes below (A, B and C) the main feature(s) which each well shows.

(5marks)

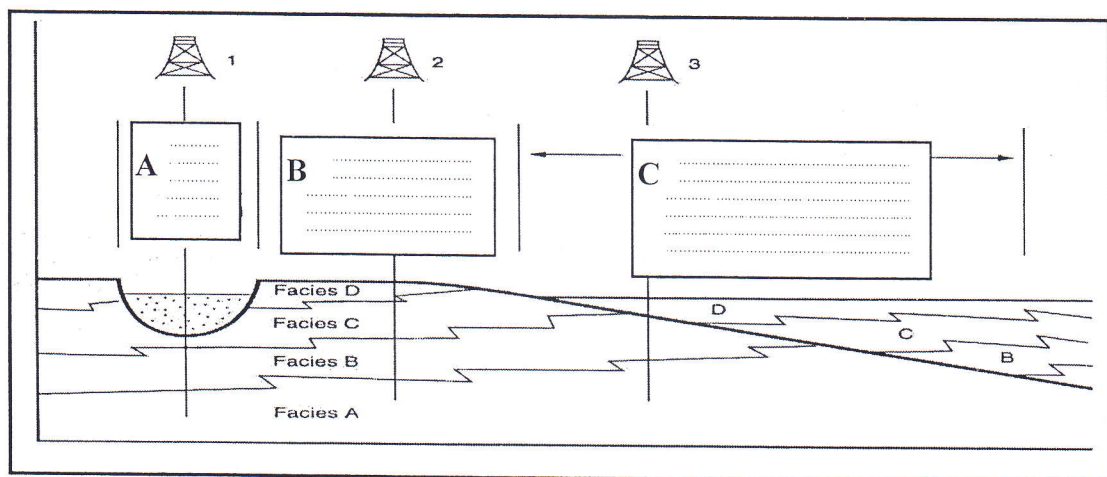
- b- Which wells show clear evidence of presence of a sequence boundary?

Well no. 1

Well no. 2

Well no. 3

(5marks)



Credit hour system - First semester - Final Examination

Geology and Geophysics Programs

Engineering Geology and Mining Geology (G 407)

Fourth Level

Allowed time 2 hour

ملحوظة: الامتحان في صفتين

Part (1) Engineering Geology Exam (25 M)

Answer (T) for True sentences Or (F) for False sentences: (One mark each)

- 1) Translational slides occur on a planar surface or on a slip plane.
- 2) Factors affecting density are mineralogy and porosity.
- 3) Discontinuities (layers, fissures) inclined inside or outside of the slope are very important regarding the stress and strength of the tunnel.
- 4) Slump is a downslope movement of coherent block of earth material.
- 5) "Hard" rocks generally have higher unconfined compressive strengths and higher Young's moduli (E) than "soft" rocks.
- 6) Slopes formed by weak rocks, such as shale, or have thick soil deposits typically fail by rotational slides.
- 7) Subsidence is the sinking of a mass of earth material below the level of surrounding material.
- 8) Granite is a good building stone if fractures are not closely spaced.
- 9) Slate is very durable, high tensile strength and difficult to work.
- 10) Topography and climate are influencing soil development.
- 11) Silt sticks to fingers and invisible to unaided eye.
- 12) ICOLD assumes a dam as big when its height is bigger than 15m.
- 13) Arch dams utilize the strength of an arch to displace the load of water behind it onto the rock walls that it is built into.
- 14) Creep is very slow and resulted of freezing and thawing.
- 15) Soil slips occur above bedrock and fail by rotational slides.
- 16) Horizontal, vertical and inclined layers have different kinds of loading conditions for tunnels.
- 17) Mass wasting refers to a downslope movement of rock or soil as a more or less coherent mass.
- 18) Slopes in soft rocks form free face with talus slope at base.
- 19) Slope is stable if safety factor < 1 .
- 20) Flow is a downslope movement of unconsolidated material in which particles move about and mix within the mass.
- 21) Landslides are commonly complex combinations of sliding and flowage.
- 22) Shallow soil slips can develop during rainstorms when slopes become saturated.
- 23) Resisting forces are the forces which move earth materials downslope.

- 24) Vegetation has root systems that tend to provide an apparent cohesion which increases resistance to landsliding.
- 25) Steep slopes are associated with rockfalls in subarid to arid environments.

(5 M) الجزء الشفوي

Answer (T) for True sentences Or (F) for False sentences: (One mark each)

- 1- Normal stress acts $\parallel$ to surfaces while shear stress acts $\perp$ to them.
- 2- Movement of debris may be very slow or very fast, depending on topographic conditions.
- 3- Rotational slides occur along a curved slip plane.
- 4- Gravity dams use their triangular shape and the sheer weight of their rock and concrete structure to hold back the water in the reservoir.
- 5- Slope angle and topography affecting slope stability.

Part (2) Mining Geology Exam (25 M)

- 1- Mention the factors that determine the economic feasibility of the ore? (5 Marks)
- 2- Describe with aid of sketch: (5marks)
 - a- Equidistant spacing method.
 - b- Triangular grouping method.
- 3- Mention the importance of mining development? (5Marks)
- 4- From the following data, calculate: (10 marks)

Section	Width, (w), inch	Assay, %
A	12	25
B	10	20
C	8	45
D	15	12
E	11	15

- 1-The average assay in this position.
- 2- The width of the vein at that sampling position.

إنتهت الأسئلة وبالتوفيق

أ.د/ جمال يحيى - قسم هندسة التعدين والفلات

أ.د/ جلال حامد الحباك - قسم الجيولوجيا

بسم الله الرحمن الرحيم

جامعة أسيوط

كلية العلوم - قسم الجيولوجيا

امتحان التحريرى للمستوى الرابع بكلية العلوم شعبة الجيولوجيا كيمياء

المادة: جيولوجية مصر 410 (ج)

(Geologic Map of Egypt) (410 G)

الزمن: ساعتان

الدرجة: ٥٠ درجة

الفصل الدراسي الأول ٢٠٢٠/٢٠٢١ م

ملحوظة: الامتحان يتكون من صفحتين

First question: Chose the correct answer (10 Marks)

- 1- Ophiolites are remnants of oceanic crust.
a) True b) False
- 2- Ophiolites in Egypt are commonly occurring as allochthonous and commonly dismembered.
a) True b) False
- 3- Dokhan Volcanocs are younger than the Hammamat Molasse Sediments.
a) True b) False
- 4- The contents between the Egyptian basement and the neighboring bedded sequences of the Nubian Sandstones are commonly normal faults.
a) True b) False
- 5- The major domes (e,g, Hafafit) are binded by
a) normal faults b) thrust fault
c) both of these d) none of these
- 6- The Cambrian rocks are well represented in north and south parts of Egypt.
a) True b) False
- 7- The surface Triassic rocks are well exposed in the central parts of Egypt.
a) True b) False
- 8- The Eocene rocks in Egypt have important.
a) Economic b) scientific c) both of these d) none of these
- 9- Abu Madi Formation important
a) Economic b) scientific c) all of these d) none of these
- 10- The age of Massaged Formation is
a) Cretaceous b) Paleogene c) Neogene d) Jurassic

Second question: (10 Marks)

- a) Compare between the Cenomanian sediments at north Sinai and Bahariya Oasis. (6 Marks)
- b) Give reasons: (4 Marks)
 - i- The variation in the thickness of the Paleozoic rocks in Egypt.
 - ii- The difficulty in the determining the geologic age of the Paleozoic rocks.

Third question: (10 Marks)

- a) Construct the subsurface stratigraphic sequence of the Paleozoic rock units in north Western Desert. (6 Marks)
- b) Define in a stratigraphic column the Miocene different rock in the Nile Delta region. (4 Marks)

Fourth question: (10 Marks)

- a) Write the geologic age and the geographic location of the following rock units: Six Hills - Maghrabi – Qiseib – Tadarat – Safa (5 Marks)
- b) Correlate the formation of the same age between column (A) and column (B) (5 Marks)

Column (A)

Thebes
Wadi Malik
Lakia
Masajid
Esna
Kurkur

Column (B)

Qisaib
Khattatba
Um Bogma
Dungul
Tarawan

Fifth question: (10 Marks)

- a) Discuss the exposed Oligocene rocks in Egypt. (5 Marks)
- b) Illustrate in a geologic time scale the subsurface rock units of the Early Cretaceous at north Western Desert. (5 Marks)

Good Luck!

Prof. Dr. Nageh A. Obaidalla

Credit hour system - First semester - Final Examination
Geology and Geophysics Programs
Economic Geology (G 434)

Fourth Level

Allowed time 2 hour

ملحوظة: الامتحان في ثلاث صفحات
(50 M) الجزء التحريري

Answer (T) for True sentences Or (F) for False sentences: (One mark each)

- 1- Metals were first used more than 40,000 years ago.
- 2- Mineral deposits formed from mid-ocean ridge volcanism are called volcanogenic massive sulfide deposits.
- 3- Banded Iron Formations are restricted to the Phanerozoic.
- 4- Type of ore body has a big influence on the choice of mining method.
- 5- Mineral paragenesis and intergrowth are important bases for the subsequent mineral processing.
- 6- Sphalerite, galena, and chalcopyrite are ore minerals from which iron, copper, and lead respect.
- 7- Bauxites are the source of the world's lead.
- 8- Many of the world's manganese deposits have been formed by secondary enrichment of low-grade primary deposits, particularly in tropical regions.
- 9- For gold mining, gossan is mined because it is more easily accessible and naturally enriched and is easier to recover.
- 10- The first people to mine and use coal were the Egyptians, about 3100 years ago.
- 11- "Mineral deposit" is an economic term, whereas "ore" is a geologic term.
- 12- In order for a deposit to form, processes must bring about a localized enrichment of one or more minerals.
- 13- Pegmatites formed by fractional crystallization of granitic magma commonly containing rich concentrations of lithium, cesium and niobium.
- 14- The dense chromite crystals settle to the bottom of the magma, producing almost pure layers of chromite.
- 15- Volcanogenic massive sulfide deposits are poor in copper and zinc.
- 16- In black smokers, the rising hydrothermal fluid appears black due to fine particles of copper sulfide.

- 17- The processes of partial melting and fractional crystallization are two ways of separating some minerals from other.
- 18- Many famous ore bodies are associated with extrusive igneous rocks.
- 19- Most stratabound deposits are diagenetic in origin.
- 20- Much of the world's lithium is mined from sedimentary rocks such as those at King's Mountain, North Carolina.
- 21- The term fossil fuels refer to the remains of plants and animals trapped in sediments that can be used for fuel.
- 22- Metasomatic deposits are formed by evaporation of lake water or seawater.
- 23- The world's principal deposits of chromite are in the Bushveld igneous complex in South Africa and the Great Dike of Zimbabwe.
- 24- Examples for late magmatic deposits are chromite, magnetite and PGE.
- 25- The most important minerals concentrated in placers are gold, platinum, cassiterite and diamond.
- 26- Pegmatites are very fine-grained crystals and poor in gemstones and rare earth elements (REE).
- 27- Tin and tungsten deposits are associated with mafic igneous rocks.
- 28- Magmatic deposits are so named because they are genetically linked with the evolution of magmas emplaced into the crust (either continental or oceanic).
- 29- Physical weathering leads to mineral concentration through the removal of soluble materials and the concentration of a less soluble residue.
- 30- A common example of a deposit formed through residual concentration is halide.
- 31- Placer deposits are any concentration of minerals formed through processes of sedimentation.
- 32- Hydrothermal deposits formed from hot aqueous solutions.
- 33- Most placers are found in stream gravels that are geologically young.
- 34- Low-grade metamorphism of marine evaporite deposits causes another important mineral, sylvite (KCl), to form from carnallite.
- 35- Mineralogy has a big influence on the mining technique chosen and the sequencing of mining operations.
- 36- Iron ores formed as a result of metamorphism are called taconites.
- 37- Ore grade is increased by metamorphism.
- 38- Banded iron formations are found in sedimentary basins on every craton.
- 39- Metallogenic Provinces are limited regions of the crust within which mineral deposits occur in unusually large numbers.
- 40- Metasomatism is a process, differs from metamorphism by the addition of components (water, metals and other ions) from the igneous intrusion.

- 41- Ore is an aggregate of minerals from which one or more minerals can be extracted profitably.
 - 42- Gangue may include quartz, feldspar, mica, calcite, or dolomite.
 - 43- All ores are mineral deposits because each of them is a local enrichment of one or more minerals or mineraloids.
 - 44- Ore mineral may be concentrated by magmatic processes within a body of igneous rock to form magmatic mineral deposits.
 - 45- Gypsum, phosphate, halite are metallic mineral deposits.
 - 46- Stratabound deposits form when a hydrothermal solution invades and reacts with muddy sediments.
 - 47- The famous copper deposits of Zambia, in central Africa, are stratabound deposits.
 - 48- World's largest and richest lead and zinc deposits are stratabound deposits.
 - 49- More than half of the gold recovered throughout all of the human history has come from placers.
 - 50- Pegmatites are crystallized from volatile-poor fluids.
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(10 M) الجزء الشفوي

Answer (T) for True sentences Or (F) False sentences: (One mark each)

- 1- All of the very large bauxite deposits formed less than 25 million years ago.
 - 2- Secondary enrichment zones are produced by deposition of soluble minerals near the groundwater table, leached from mineral deposits present near the surface.
 - 3- Iron and silver were the earliest metals used.
 - 4- One of the largest nickel deposits ever found, in New Caledonia, was formed by secondary enrichment.
 - 5- Mineral deposits are any volume of rock containing an enrichment of one or more minerals.
 - 6- Gangues are defined as waste materials associated with ores.
 - 7- ~~Volcanogenic massive sulfide deposits associated with mid-ocean ridge volcanism.~~
 - 8- Porphyry Cu, Mo deposits are commonly associated with plutonic and intermediate igneous rocks.
 - 9- Residual deposits are formed by removal of soluble minerals (leaching)
 - 10- Calcareous (e.g., limestone, dolostone) rocks are most suitable for the formation of skarns.
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Credit hour system - First semester - Final Examination

Geology and Geophysics Programs
Ore microscopy and ore Petrology (G 431)

Fourth Level

Allowed time 2 hour

ملحوظة: الامتحان في اربع صفحات
(50 M) الجزء التحريري

Answer (T) for True sentences Or (F) for False sentences: (One mark each)

1. The presence of exsolution textures indicates a maximum temperature of formation.
2. Regional zoning occurs on a very large scale, often corresponding to large sections of orogenic belts and their foreland.
3. Age dating is based on the radioactive decay of an unstable parent isotope to a more stable isotope of a different element (daughter).
4. Pyrite, hematite and magnetite have a remarkable power of crystallization and develop well formed crystals even under adverse conditions.
5. Deformational lamellar twins are characteristic in chalcopyrite and stannite.
6. Zoning is sometimes visible in ordinary light due to color contrasts, physical discontinuities or zonally arranged inclusions.
7. The presence of three or more sets of cleavages may give rise to triangular pits usually arranged in rows parallel to one set.
8. Pyritohedron pyrite forms at very low temperatures while colloform pyrite forms at higher temperature.
9. In isotropic minerals, twinning is generally not visible unless the surface is etched.
10. Sphalerite can be seen to have much lower reflectance than neighboring pyrite.
11. Bireflectance is the change in intensity of the light reflected from a mineral as it is rotated on the microscope stage.
12. Reflection pleochroism is the variation in tint of a colored mineral observed as it is rotated on the microscope stage.
13. Dissolved impurities do not affect reflectivity.

14. Poorly polished pyrite often shows apparent anisotropy which will disappear if the polish is improved.
15. Some anisotropic minerals show a distinct and characteristic sequence of colors as the polarizer is turned, degree by degree, to and beyond the minimum position.
16. Sphalerite is sufficiently translucent or transparent to admit incident light to substantial depths below the surface of the specimen.
17. Hardness is defined as the resistance that a body opposes the penetration of another body.
18. The percentage of plane polarized light reflected from a mineral grain is not determined easily in a quantitative manner.
19. Eye is relatively good at noting differences in reflectance of two adjoining minerals.
Where one of the two minerals is known, it can be possible to know the relative reflectance of the other.
20. Molybdenite appears bright against the gangue, but when there is arsenopyrite in the field, the molybdenite is so dull that it hardly appears to be the same mineral as before.
21. Inclusions depend to some extent on the mode of formation of the guest and the host.
22. Crystals that formed at low temperatures have higher electrical conductivities.
23. Twinning is best seen in anisotropic minerals under crossed polars.
24. The hardness is defined as the resistance that a body opposes the penetration of another body.
25. Some ore minerals, particularly harder ones viz., pyrite, hematite, wolframite, arsenopyrite, cobaltite and magnetite have a remarkable power of crystallization and develop well formed crystals even under adverse conditions.
26. Indentation hardness is relative hardness measurements while the Polishing and scratch hardness are used for the quantitative measurement.
27. Many ore minerals exhibit zonal growth in the form of concentrically shelled structure indicating deposition in successive layers around a nucleus.

28. Minerals may exhibit one to three sets of cleavages depending upon the number of sets present and the orientation of the polished surface with respect to these.
29. Native silver is anisotropic mineral with low reflectivity.
30. More sets of cleavages are characteristic of galena, and may also be present in magnetite and pentlandite.
31. Twinning is best seen in anisotropic minerals under crossed polars.
32. Change of reflectance is a property called reflection pleochroism, and the change of color (or tint) is the property called bireflectance.
33. Twinning is sometimes evident from abrupt changes in the orientation of cleavages or of rows of inclusions.
34. Sphalerite containing minute inclusions of chalcopyrite or pyrrhotite is characterized by internal reflection.
35. As the distance between the objective lens and the polished section is increased (i.e. the stage is lowered) the Kalb light-line will move into the harder mineral.
36. Incident light can vary depending on the level of transparency to penetrate deep into the crystal.
37. Internal reflections occur at discontinuities such as crack and fracture surfaces and at grain and twin boundaries.
38. Amount of FeS in sphalerite decreases with pressure.
39. More than one grain must be observed before concluding that a mineral is isotropic.
40. Any anisotropic mineral may show an isotropic section by fortuitous orientation.
41. Color is a characteristic and diagnostic mineral property that can be used to identify minerals.
42. Intergrowths refer to simultaneous deposition of one mineral with another.
43. Polishing hardness is the resistance of a particular mineral to abrasion during the polishing process.
44. Many minerals have shades of gray and 'off-white' to white.

45. Pentlandite is anisometric mineral and remains unchanged in color and brightness as the stage of the microscope is turned.
46. Growth, inversion and deformation types of twinning may be observed in ore minerals seen in polished sections.
47. Exsolution is a product of breakdown of a solid solution into two components.
48. Estimation of the temperature of formation of a mineral or a mineral assemblage is called geothermometry.
49. Internal reflection is usually numerous in sphalerite rich in iron.
50. Pyramidal or short prismatic cassiterite forms at high temperatures.

الجزء الشفوي (10 M)

Answer (T) for True sentences Or (F) False sentences: (One mark each)

1. Bireflexion in minerals may be due to changes in the rate of growth.
2. Smoky quartz and amethyst lose color at around 250°C, so their presence indicates temperatures below 250°C.
3. Eutectic temperatures are very useful, since they provide estimates for assemblages, and they closely resemble natural systems.
4. Oxygen isotope ratios (O^{18}/O^{16}) are temperature-dependent, and they are used as geothermometers for pairs of minerals.
5. Harder minerals, e.g. chalcopyrite, galena, tetrahedrite and pyrargyrite have somewhat lower powers of crystallization and form crystals only in open spaces.
6. Estimation of the pressure of formation of a mineral or a mineral assemblage is called geobarometry.
7. Zoning is defined as the ratio of the intensity of the light reflected by a mineral to the intensity of the light incident upon it, expressed in percent.
8. Pressure of formation may be estimated using the equipment known as nomograms.
9. The order of deposition is determined by studying mineral assemblages under microscope.
10. Textures and structural relationships between minerals are used to decide which mineral is formed earlier.