Third question (5 degrees, 1 degree each)
Define the following scientific terms

1. Index fossils
2. Taxonomic hierarchy
3. Convergence
4. Coccolith
5. Commissure line in Brachiopoda

Fourth question (10 degrees, 1 degree each)
Choose the correct answer.

1. ..... are characterized by restricted occurrence to the photic zone
   a. Ostracods b. Conodonts c. Calcareous nannofossils d. Foraminifera
2. One of the following macrofossils has two unequal valve knows as.....
   a. Brachiopod b. Bivalve c. Ostracods d. Gastropod
3. During the Paleozoic Era ..... foraminifera were an important rock forming fossil
   a. planktonic b. Fusulina c. benthonic d. nummulitic
4. When calcite crystals arranged randomly in foraminifera wall, it termed as..... wall structure
   a. Hyaline b. Porcelaneous c. Agglutinated d. None of them
5. Operculum is a calcareous plate covers the aperture in ..... shells.
   a. Gastropod b. Bivalvia c. Cephalopoda d. Foraminifera
6. One of the following phyla is characterized by its radial symmetry knows as.....
   a. Mollusca b. Cnidaria c. Porifera d. Foraminifera
7. The Trilobites firstly appeared in .....Period
   a. Cambrian b. Ordovician c. Permian d. Jurassic
8. All the following microfossils cannot be occurring below the CCD except.....
   a. diatoms b. calcareous nannofossils c. foraminifera d. gastropods
9. During the..... boundary, trilobites reach their acme.
   a. Paleocene/Eocene b. Cretaceous/Paleogene c. Triassic/Jurassic d. Cambrian/Ordovician
10. To extract microfossils from shales and clays, ...method usually used.
    a. Chemical b. Mechanical c. hydraulically d. None of them

Fifth question
Write on the following statement (10 degrees, 5 each).

1. Function of coccoliths and nutrition of coccolithophores.
2. Diatomaceous sediments and diatom applications.

انتهت الأسئلة.....بالتوفيق والنجاح

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

First Semester Final Examination
Zoology Students
(Paleontology)

January 2025	G211	50 Marks	Time: 2 hours

ملحوظه: الامتحان يتكون من ورقة واحده على الوجهين

Answer the following questions.

First question (10 degrees, 1 degree each)
Put true or false in front of the following sentences

1. Fossils represent one of several direct evidence for ancient life.
2. The preserved tracks of organisms can tell us a lot of information about their behavior in the geological past.
3. Phylogeny focused on studying of origin and development of an organism from the fertilized egg to its mature form.
4. Foraminifera wall structure is an unstable morphological feature and could be changed through time.
5. Calcareous nannoplankton are homogeneous group of marine living organisms that are generally less than 30 µm in size.
6. Inarticulate brachiopods are often the most common fossil brachiopods in the geologic time scale.
7. Teeth and sockets are often found in both valves in brachiopod shells.
8. The periostracum layer in Bivalvia is mostly preserved in the fossil state.
9. Trilobites are extinct marine fossils that disappeared in the Mesozoic Era.
10. A small portion of rock sample is enough to extract conodonts from the matrix.

Second question (15 degrees, 5 degrees each)

1. Discuss the effect of alkalinity change on foraminifera shells.
2. Write on the morphology of diatoms.
3. Write on the types of dentitions in Bivalvia.

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جامعة أسيوط
كلية العلوم - قسم الجيولوجيا

امتحان التحريرى لطلاب المستوى الثانى بقسم الجيولوجيا (جميع الشعب)
المقرر: علم الطبقات (٢١٠ ج)
الفصل الأول (دور يناير) - العام الجامعى ٢٠٢٤-٢٠٢٥م

الدرجة الكلية للأمتحان: ٥٠ درجة — الزمن: ساعتان

Answer the following questions:

Q1: Choose if the following statements are true (√) or false (X) (10 marks; 1mark each)

1- In subsurface stratigraphy a horizon dip can be measured using a single borehole.
2- Igneous plutons intruded into pre-existing rocks conform to law of cross-cutting relationships.
3- The "Partial Range Zone" represents strata containing the maximum diversity of a particular taxon.
4- The "Formation" is the basic lithostratigraphic unit.
5- Correlation can be based on composition of rock units, position of similar rock units in a sequence and occurrence of marker beds.
6- In magnetostratigraphy we correlate rock successions using their physical characters, such as rock constituents and structures.
7- Bracketing relationships can be applied in defining relative ages of rocks.
8- The numerical dating form the most important basis in chronostratigraphy.
9- The vertical variation in rock colors can be used to infer superposition.
10- Short ranging species constitute the majority of fossils recorded on Earth.

Q2: Shade the correct answer; A, B, C or D (5 marks; 1mark each)

1- The principal of original horizontality states that .....
A- igneous rocks form horizontal layers B- all rocks in the earth are layered horizontally
C- sediments deposited initially horizontally D- sedimentary rocks deposited initially inclined

2- Physical processes that acted in the geologic past and still working today conform to the law of
A- inclusions B- uniformitarianism C- strata continuity D- faunal succession

3- If a "Stratotype" is damaged another must be determined; in this case it is termed .....
A- Holostratotype B- Parastratorype C- Neostratotype D- lectostratotype

4- If you have a radioactive carbon date; what type of dating and stratigraphic method is this?
A- Chronostratigraphy, relative dating B- Lithostratigraphy, relative dating
C- Chronostratigraphy, absolute dating D- Biostratigraphy, relative dating

5- Global boundary Stratotype Section and Point defines the .....
A- lower boundary of a Stage B- upper boundary of a Stage
C- lower boundary of a System D- upper boundary of a System

Q3: The selection and ratification of a Global boundary stratotype (GSSP) is based on specific methodology, discuss this statement and give an example of a GSSP from the Phanerozoic.
(15 marks)

Answer <u>TWO ONLY</u> from the following questions:

Q4: Answer the following question (10 marks; 2.5 marks each)
- Write briefly on: A- Caliper logs B- Law of superposition
C- Resistivity logs D- Importance stable carbon isotopes in stratigraphy

Q5: Answer the following question (10 marks; 5 marks each)
- Write on: A- The basic principle of seismic stratigraphy B- Lithostratigraphic units

Q6: Answer the following question (10 marks; 5 marks each)
- Write an essay on: A- Unconformities B- Assemblage zones

إنتهت الأسئلة مع أطيب الأمنيات بالتوفيق

Examiners: *Prof. Dr. Magdy S. Mahmoud & Prof. Dr. Amr S. Deaf (Geology Department)*

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46) To record arrival times of seismic waves on land we use:
a. hydrophones b. electrodes
c. geophones d. resistivity meters

47) One of the problems in interpretations of seismic refraction data is:
a. the increase in velocity with depth b. hidden layers
c. low resistivity layers d. none the above

48) 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

49) The correction of gravity data due to the variation in density of earth materials is called:
a. Drift correction b. free air correction
c. latitude correction d. Bouguer correction

50) We can increase the penetration depth in electrical resistivity by:
a. decreasing the current electrode spacing
b. decreasing potential electrode spacing
c. increasing the potential electrode spacing
d. increasing the current electrode spacing

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

End of questions Good luck.....

Instructor: Prof. Dr. Gamal Zidan Abdelaal

34) Subsurface cavities filled with air will show:
a. resistive response b. conductive response
c. no response d. all the above

35) Self-potential method is best suited for the exploration of:
a. velocity of seismic layers b. massive ore deposits
c. electrical resistivity of layers d. all the above

36) The presence of sulfide ore deposits can result in:
a. low positive SP anomaly b. high negative SP anomaly
c. high positive SP anomaly d. low negative SP anomaly

37) Rock density can be determined by:
a. borehole gravity measurements b. Nettleton's method
c. Nafe-Drake curves d. all the above

38) To make Self-Potential measurements we need:
a. high impedance voltmeter b. electric wires
c. non-polarizable electrodes d. all the above

39) 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

40) The variation in gravity acceleration from the pole to the equator equals to:
a. 10% b. 5%
c. 1% d. 0.5 %

41) The parameters which affect the elapse time of transmission of a pulse from its source to the detector are:
a. propagation velocity of the seismic wave
b. electrical resistivity of the subsurface
c. geometry of the propagation path
d. a and c

42) Bulk modulus is defined as:
a. shear stress over shear strain
b. volume stress over volume strain
c. shear stress over volume strain
d. volume stress over shear strain

43) Primary seismic waves can travel through:
a. gases b. liquids
c. solids d. all the above

44) which of the following considers surface waves:
a. primary waves b. love waves
c. secondary waves d. none the above

45) The angle of incidence that results in an angle of refraction equals to 90° is called:
a. absolute angle of refraction b. relative angle of refraction
c. critical angle of refraction d. none the above

19	Electrical resistivity cannot be used to map salt-water intrusion		
20	Electrokinetic potentials result from the flowing of fluid through a capillary or porous medium		
21	Base station readings are used to determine the temporal variations in gravity and to correct for drift error in readings		
22	Seismic wave is defined as the transfer of energy by way of particle motion		
23	The higher the value of the modulus, the stronger the material, and the smaller the strain produced by a given stress		
24	Primary seismic waves are slower than secondary seismic waves		
25	Secondary seismic waves can travel through liquids		

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

26) The physical property of rocks that is most commonly utilized in seismic method is:
a. acoustic velocity
b. density
c. magnetic susceptibility
d. electrical resistively or conductivity

27) Electrical conduction occurs by:
a. electronic conduction
b. electrolytic conduction
c. dielectric conduction
d. all the above

28) The normal gravity acceleration at the surface of the earth equals to:
a. 9.8 m/s2
b. 980 Gal
c. 9800 g.u.
d. all the above

29) Which of the following control the electrical resistivity of earth materials:
a. magnetic susceptibility
b. water content
c. porosity
d. b and c

30) True resistivity can be obtained when the subsurface is:
a. isotropic and homogeneous
b. anisotropic and homogenous
c. isotropic and inhomogeneous
d. anisotropic and inhomogeneous

31) Choosing the best electrode array for resistivity survey depends on:
a. type of structure to be mapped
b. sensitivity of the resistivity meter
c. background noise level
d. all the above

32) The correction of gravity data due to elevation only is called:
a. Drift correction
b. free air correction
c. latitude correction
d. Bouguer correction

33) Electrical resistivity method can be used to map:
a. groundwater
b. minerals and ore deposits
c. paleochannels
d. all the above

Prof. Dr. Gamal Zidan Abdelaal

Assiut University
Faculty of Science
Department of Geology

Date: January 2025
Time allowed: 2 hours

Final Exam

Principles of Geophysics (PG 250), Total 50 Marks

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

No	Statement	TRUE (√)	FALSE (X)
1	Geophysics comes in two basic flavours, pure geophysics and applied geophysics		
2	The measured parameter in seismic refraction survey is the travel times of refracted seismic energy		
3	Geology is limited to the surface of the Earth however geophysics adds information about the 3rd dimension		
4	The force of attraction between two bodies is directly proportional to the square of the distance between them		
5	Electrical resistivity is a passive method whereas self-potential is an active method		
6	Electronic conduction occurs in in materials containing free electrons such as the metal		
7	The typical gravity anomaly size does not vary greatly because of the very narrow range of rocks density		
8	With increasing salinity of water in rocks and sediments, the electrical conductivity increases		
9	Porosity is one of the fundamental factors controlling the electrical resistivity of sedimentary rocks		
10	The presence of clay will increase the electrical resistivity in rocks and sediments		
11	Pendulums and falling masses are two different methods for measuring relative gravity		
12	Resistivity decreases with increasing metallic minerals content		
13	Apparent resistivity is defined as the resistivity of an equivalent but fictitious half space and depends on electrode geometry and spacing		
14	Schlumberger array is best suited for vertical electrical sounding survey		
15	By increasing the electrode spacing, more of the injected current will flow to shallower depths		
16	The gravity acceleration at the pole is smaller than that at the equator		
17	One of the disadvantages of electrical resistivity method that it is less costly than drilling		
18	One of the disadvantages of electrical resistivity method that the electrodes must be in a good contact with soil		

Assiut University
Faculty of Science
Geology Department

Fossilization and Plant Fossils G219
Written Exam
1st Semester, 2025

Answer the following questions

Q1: Chose the correct answer (5 marks: 1 mark each)

1- 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

2- Trace fossils are represented for example by:
   a- shells b- burrows c- bones d- leaf imprints e- all of them

3- The most important criteria for spores and pollen grains to be distinguished under the light microscope at generic and specific levels are:
   a- aperture & ornamentation b- wall structure & ornamentation
   c- grain size & grain symmetry d- none of them

4- Alteration of fossil body parts may include:
   a- recrystallization b- replacement c- carbonization d- petrification e- all of them

5- Trilete spores are characterized by……..symmetry.
   a- isopolar b- radial c- bilateral d- heteropolar

Q2: Mark the correct and the wrong statements, and correct the wrong (10 marks: 2 marks each)

1- Dinoflagellates are classified using the International Code of Zoological Nomenclature (ICZN) as protozoans.
2- New and inexperienced HF users should be monitored by experienced laboratory personnel.
3- Entombment is material trapped inside coating such as amber.
4- In a pollen tetrad, aperture is located at the proximal face.
5- Mesophragm is a single wall surrounds an internal cavity called autocoel.

Q3: Define Only Five of the following (10 marks: 2 marks each)

Necrology, aperture, dinoflagellate, coprolites, pollen grain, autophragm, fossil tracks.

Q4- Write briefly on Only TWO of the following: (25 marks: 12.5 marks each)

1- Cavation in dinoflagellate cyst wall (with drawings).
2- Taphonomy and their stages.
3- Aperture, symmetry, and sculpture in fossil spore grains (with drawings).

---------- ***End of Exam*** ----------

Examiner: **Prof. Amr S. Deaf**

Good Luck

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3) A- Draw the structure of the T-O phyllosilicate minerals group. Give the empirical formula and names of minerals belong to these group.

B- The plagioclase feldspars is a continuous solid solution series, Explain this statement. Mention the names and chemical composition for minerals component of this series. What is the difference between: pathetic inter- growth and perklien (Cross hatching) texture in feldspars. (7½ Marks)

بالتوفيق،،، Examiner Prof. Dr. Nadia Sharara

a. two tetrahedral and one octahedral sheets b. one tetrahedral and one octahedral sheets

c. one tetrahedral and two octahedral sheets

9) Silicates structure in which two tetrahedron sharing all oxygen is called:

a. Double chain silicates b. Sorosilicate c. Tectosilicates

10)The chemical formula of epidote minerals classified them as:

a. Disillicate b. Nesosilicates c. Mmixture between disillicates and nesosillocates

11) Exsolution of albite bodies within orthoclase host crystals are called:

a. perthite texture b. solid solution c. antiperthite texture

12) The low temperature feldspars are characteristic to:

a. volcanic rocks b. sedimentary rocks c. plutonic rocks

13) Mica group minerals have:

a. TOT+C layer structure b. TO layer structure c. TOT+O layer structure

14) The Si: O ratio in the amphibole is:

a.4:10 b. 4: 11 c.4:8 d. 1:3

15)The cations fill octahedral sites in the O-sheet of trioctahedral phyllosilicate are:
a. Trivalent b. Divalent c. Monovalent d. Tetravalent

Question No. 3 (Total 15 Mark) (Each One 7½ Marks)

Answer Two Questions Only from the following illustrating your answer by drawing

1) A- Draw the geometric staking in the double chain silicate minerals. Give the structural formula of this group . Explain How the classification of this silicate group; to sub groups; is mainly chemically dependent. Give at least two mineral names representing this classification . What are the general optical characters of this of this group.

B- Define the difference between: Exsolution and multi twinning in feldspar minerals. (7½ Marks)

2) A- What are the basic structural difference between the SiO_4 tetrahedral linkage in the Neso silicate and the Sorosilicate group minerals Giving the empirical formula of these two silica groups and the names and important optical properties for at least Two minerals represent these two groups.

B- Draw the structure of Biotite and Give its chemical formula.(7½ Marks)

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15) In phyllosilicates structure the tetrahedral sheets combined with octahedral sheet by removing OH- group the octahedral sheet to make vacancy for the apical oxygen in the tetraherdal sheets .

16) Pyralspite garnet type $(Mg, Fe, Mn)_3 (Al)_2(SiO_4)_3$ and Ugrandite garnet type $(Ca)_3(Cr, Al, Fe^{3+})_2(SiO_4)_3$ both types show complete solid solutions.

17) Double chain minerals characterized by two sets of cleavages intersect at about 87^o and 93^o and the single chain minerals characterized by two sets of cleavages intersect at about 124^o and 56^o.

18) In the tectosilicates when two silicon ion from each four tetrahedron replaced by two Al ion the resulted deficiency in positive charge is balanced by introduction of monovalent Ka cation.

19) (Na K) $(Al Si_3) O_8$ is the anorthite component of the feldspar minerals .

20)There is a complete Mg- Fe substitution in the orthopyroxen solid solution series.

Question No.2 (Total marks15, One Mark for each),

2- Choose the correct answer

1) Clinopyroxene minerals characterized by the presence of Ca in

a. M1 site b. M2 site c. M1 and M2 site

2) The silicate mineral group structure in which all 4 oxygen are shared is called:

a- Nesosilicates b. Sorosilicate c. Tectosilicate d. single chain silicates

3) According to Bown's series the last mineral crystallized in the magma is

a. Olivin b. Orthoclase c. Biotite d. Quartz

4) The Pyroxene minerals have

a. have empirical formula XYZ_2O_6 b. have two tetrahedrons one sharing 3 Oxygen and other sharing 2 Oxygen c. have empirical formula XYZ_2O_5

5) Beryl has chemical formula

a. $Be_3Al_2Si_6O_{18}$, b. $Al_2SiO_4(F,OH)_2$ c. $CaO.Ti SiO_4$ d. SiO_4

6) Kyanite mineral can be used as

a. geothermobarometry b. geochronometer c. geothermometer

7) The general formula of the silicate in ring structure is:

a. $(SiO_4)^{4-}$ b. $(Si_2O_5)^2$ c. $(SiO_3)^{2n}$

8) TOT-phyllosilicate structure is characterized by the presence:

Faculty of Science
Final Exam
January 2025

Assiut University
Rock forming minerals (G.230)

Geology Department
Time allowed:2hours
Total Marks 50

Question No. 1 (OneMark for each. Total marks 20) Answer the Following Questions
Indicate by the sign (✓) or (X) the following statements:

1)The magma fractional crystallization process cause a continuous change in the chemical composition of the melt with new growing crystal which differ from that already grown from it.

2)-Solid solution is applied to a mixture when the crystal structure of the mineral remain unchanged by replacement or addition of the elements.

3) In clinopyroxenes group the M2 site is occupied by Fe^{2+} and Mg^{2+} while in orthopyeroxene a larger atoms than Fe^{2+} or Mg^{2+} enter in M2 site.

4) In the phyllosilicates fundamental unit, if cations are trivalent , 2/3 of octahedral cations in the fundamental unit are occupied and the octahedron sheets are called Tioctahedral sheet .

5)-In Brittle Mica: X sites is occupied by Mg

6) Peridote (Zabarget) is almost pure Mg - olivine have of pale green color.

7) Solid solutions with a predominance of An + Ab are called alkali feldspars, those predominantly composed of Ab + Or are called plagioclase feldspars.

8) The double chain and sheet silicate mineral group are anhydrous minerals.

9) Coesite is high pressure polymorph silica found in rocks subjected to impacts of meteorites.

10) Tourmaline is six ring silicate mineral found in highly siliceous rocks .

11)The transformation of α quartz to β quartz is reconstructive transformation, while the changes between quartz, tridymite and cristobalite displacive transformation .

12) Fibrous Varity of quartz is called Amethyst .

13)The triclinic pyroxenoids has Ca/ (Ca+Mg+Fe) < 50%

14) In dictahedral sheet phyllosilicates , if cations are divalent , 2/3 of octahedral cations in the fundamental unit are occupied.

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11-Mineral show colourless is
a-feldspar c-chlorite c-actinolite
12-Mineral show dipleochroic colour is
a-tourmaline c-olivine c-quartz
13-Mineral show tripleochroic colour is
a-feldspar c-zircon c-hornblende
14-Mineral show isotropic is
a-halite b-biotite c-zircon
15 Mineral show isotropic is
a-fluorite b-muscovite c-feldspar
16-Mineral show isotropic is
a-garnet b-augite c-hypersthene
17-Mineral show isotropic is
a-pyrite b-augite c-hypersthene
18-The most common cause of alteration is by
a-water b-pressure c-temperature
19-The most common cause of alteration is by
a-weathering b-pressure c-CO_2
20-Inclusions may be
a-gaseous b-solid c-all of these

Answer of the following quactions:
1-What the interference figure of uniaxial mineral (10 marks)
2-Compared between the alteration and pleochrism (10 marks)

Good luck
Prof. Dr. Mohamed Abd El-Raouf Hassan

Geology Department
Faculty of Science
Assiut University

Time: 2 H
Jap. 2025

Optical Mineralogy (235 G)
Total Marks 50

I-Indicate by the sign (✓) or (×) (10 marks):

1-If we rotate the biaxial mineral around the minor axis we get a shape that is flattened along the rotation axis and is said to be optically negative ( )
2-If we rotate the biaxial mineral around the major axis the ellipsoid is elongated along the rotation axis and is said to be optically positive ( )
3-Biaxial materials have one principal symmetry axis and are tetragonal, hexagonal, or trigonal ( )
4-Birefringence and thickness both decrease uniformly with increasing angle from the optic axis of uniaxial mineral ( )
5-There are one optic axis of biaxial minerals ( )
6-Biaxial minerals are cubic, monoclinic or triclinic ( )
7-Isotropic mineral do give interference figures ( )
8-When 2V is acute about Z: (+) ( )
9-When 2V is acute about X: (-) ( )
10-When 2V = 0°, mineral is uniaxial ( )

2-Choose the correct answer of the following (20 marks)

1-Cross-hatching occur in
a-hornblende b-plagioclase c-microcline
2-A simple twin occur in
a-hornblende b-plagioclase c-orthoclase
3-Polysynthetic or albite twins occur in
a-olivine b-plagioclase c-orthoclase
4-Parting occur in
a-olivine b-plagioclase c-orthoclase
5-Mineral have brown colour is
a-hornblende b-tourmaline c-chlorite
6-Mineral show colourless is
a-quartz c-tourmaline c-biotite
7-Mineral have green colour is
a-hornblende b-biotite c-muscovite
8-Mineral have yellow colour is
a-staurolite b-albite c-orthoclase
9-Mineral have brown colour is
a-hornblende b-biotite c-chlorite
10-Mineral show colourless is
a-muscovite b-tourmaline c-biotite

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17-The Earth has a hydrosphere consisting of water, ice, and water vapor. This hydrosphere is an unique characteristic of the Earth among the other planets. Why? (2 marks)

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18-Contaminants in surface water come primarily from: (2 marks)

a.....
b.....
c.....
d.....

19- Just mention the factors influencing the style of volcanism (i.e. Explosive vs. Quiescent)

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.....

20-Slope Remediation Techniques involve: (2 marks)

a-.....

b-.....

c-.....

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* Good Luck *

Prof. Dr. Mamdouh Farrag Soliman

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8- Fall is

a. a block rotation / tipping
b. mass sliding along well-defined failure surface
c. free vertical drop of pieces from a cliff or steep slope.
d. all above

9-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

10-The heavy metals that can contaminate the surface water include:

....

11-When the temperature of water rises, the amount of dissolved oxygen

a. Decreases b. increases c. unchanged

12- Liquid mercury is sometimes used to extract gold from crushed rock in mines

a. it used to bonds with gold to form a semi-solid gold "amalgam
b. it used to dissolve the gold
c. it used to re-melt the gold and the crushed rock

13-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

14- 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.

15-Acid mine drainage can cause acidification of

a. surface water bodies b. Groundwater c. Both d. Non

II- (Questions 16-20, 2 marks for each);

16- The life on the Earth's surface has had an intense influence on the chemical evolution of the Earth's atmosphere. Clarify that? (2 marks)

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

Final Exam of Geomorphology and Environmental Geology (201G)
For 2nd year students- 2024-2025
Jan. 20 , 2025

Part II - Environmental Geology
Time: one Hour Total marks: 25 Examiner : Prof. Mamdouh Farrag Soliman

الامتحان فى ثلاث صفحات

I- (Questions 1-15, one mark for each); **أجب فى نفس ورق الأسئلة**

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

1- The earth's early atmosphere was quite different from the modern one.
a. It probably consisted dominantly of hydrogen and helium
b. It probably consisted dominantly of nitrogen and methane
c. It probably consisted dominantly of nitrogen and oxygen

2-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 d. All above e. None above

3-The fact that the Earth is a closed system has two important implications for environmental geology, mention them?
.....
.....
.....

4- Volcanic ash, cinders, and bombs are examples of _____ material.
a. plutonic b. fissures
c. pyroclastic d. metamorphism

5- 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

6- Active volcanoes
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

7- Which magma of the following rocks is more viscous?
a. Rhyolitic/Granitic magma b. Andesitic/intermediate magma c. basaltic magma

a-Two optic axis directions b-One optic axis direction
c-no optic axis direction
3-Uniaxial minerals have
a-Two optic axis directions b-One optic axis direction
c-no optic axis direction
4-The most characteristic mineral twins are
a-feldspar b-bioteite c-muscovite
5-Cross-hatching occur in
a-hornblende b-plagioclase c-microcline
6-A simple twin occur in
a-hornblende b-plagioclase c-orthoclase
7-Polysynthetic or albite twins occur in
a-olivine b-plagioclase c-orthoclase
7-Parting occur in
a-olivine b-plagioclase c-orthoclase
9-Mineral have brown colour is
a-hornblende b-tourmaline c-chlorite
10-Mineral show colourless is
a-quartz c-tourmaline c-biotite
11-Mineral have green colour is
a-hornblende b-biotite c-muscovite
12-Mineral have yellow colour is
a-staurolite b-albite c-orthoclase
13-Mineral have brown colour is
a-hornblende b-biotite c-chlorite
14-Mineral show colourless is
a-muscovite c-tourmaline c-biotite
15-Mineral show colourless is
a-feldspar c-chlorite c-actinolite

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

Crystallography and mineralogy (G234)

Time: Two Hours **Jan., 2025**

Total Marks (50)

Answer the following questions (25 Marks):

1-Sterographic projection of the following forms:
Octahedron, Rhombic-dodecahedron, Trioctahedra and Trapezohedra, in cubic system **(9 Marks)**

2-Sterographic projection of the following forms:
First order prism, Second order prism, Ditetragonal prism and Second order bipyramidal in tetragonal system. **(8 Marks)**

3-Sterographic projection of the following forms:
Prism, A-dome, B-dome and bipyramidal in orthorhombic system. **(8 Marks)**

4-Indicate by the sign (✓) or (×) (10 marks):

1-If we rotate the biaxial mineral around the minor axis we get a shape that is flattened along the rotation axis and is said to be optically negative ( )
2-If we rotate the biaxial mineral around the major axis the ellipsoid is elongated along the rotation axis and is said to be optically positive ( )
3-Biaxial materials have one principal symmetry axis and are tetragonal, hexagonal, or trigonal ( )
4-Birefringence and thickness both decrease uniformly with increasing angle from the optic axis of uniaxial mineral ( )
5-There are one optic axis of biaxial minerals ( )
6-Biaxial minerals are cubic, monoclinic or triclinic ( )
7-Isotropic mineral do give interference figures ( )
8-When 2V is acute about Z: (+) ( )
9-When 2V is acute about X: (-) ( )
10-When 2V = 0°, mineral is uniaxial ( )

Choose the correct answer of the following (15 marks):

1-Isotropic mineral have
a-Two optic axis directions **b-One optic axis direction**
c-no optic axis direction
2-Biaxial minerals have

3. Which of the following is representative of the formula for plagioclase?
(A) $(Ca,Na)(Al,Si)AlSi_2O_8$ (B) $KAlSi_3O_8$ (C) NaCl (D) $Ca_5(PO_4)(F, Cl, OH)$

4. A mineral is named and classified mainly by what criteria?
A) major cations B) crystal class C) major anionic component D) space group symmetry

5. The strongest bond of following is
A) ionic B)Van der val C) Covalent d) Metallic

6. Which of the following minerals are built from the independent silicate structure?
(A) Olivine (B) Pyroxene (C) Amphibole (D)Biotite

7. Which of the following minerals are built from the single chain silicate structure?
(A) Olivine (B) Pyroxene (C)Amphibole (D) Biotite

8. Which of the following minerals are built from the double chains silicate structure?
(A) Olivine (B) Pyroxene (C) Amphibole (D) Biotite

9. Which of the following minerals are built from the sheet silicate structure?
(A) Olivine (B) Pyroxene (C) Amphibole (D) Biotite

10. **Under microscope, the distinguishing between pyroxene and amphibole mineral groups using:** (A) Angle between cleavage planes (B) extinction (C) Color (D) Pleochroism

II. Answer <u>THREE ONLY</u> the following questions

1. **A) The definition of a mineral includes specific criteria that must be meant in order for a material to be classified as a mineral. List these five criteria. (3 pts)**
   B) Rearrange the following mineral group according to the Bowen's series reactions: Amphibole-olivine – quartz- pyroxene- biotite (2pts)
2. **How do we get framework (tectosilicate) silicates with formulas different from SiO_2? (5 pts)**
3. **In olivine solid solution series Fo (Mg_2SiO_4) and Fa (Fe_2SiO_4) (5pts)**
   A) What are the elements that can undergo ionic substitutions?
   B) What is the type of substitutions and solid solution?
   C) What are the factors controlling this substitution processes?
   D) Which mineral is higher in temperature of formation Fe_2SiO_4 or Mg_2SiO_4?
4. **What is the difference between the following? (5 pts)**
   A) Isomorphism and polymorphism
   B) Chemical formula of pyroxene and amphibole

LOOK BACK

Best wishes Mohamed Abdel- Moneim

Geology Department Faculty of Sciences Assiut University Second level		First Term Examination Crystallography and Mineralogy (231 G) January, 2025 Two Hours

Part one: Crystallography

I. Choose the correct answer from A,B,C,D

1. **Equal lengths and perpendicular crystallographic axes are represent**
   (A)Tetragonal (B) Hexagonal (C) orthorhombic (D) Isometric
2. **Crystals that have 4 axes, one (c) is being different length and six-fold symmetry are**
   (A) Trigonal (B) Hexagonal (C) Monoclinic (D) Orthorhombic
3. **Crystals that have perpendicular crystallographic axes of unequall lengths are:**
   (A) Triclinic (B) Monoclinic (C) Trigonal (D) Orthorhombic
4. **The roto-inversion axis bar 3 is equivalent to:**
   (A) 3m B) 6m C) 3/m D) 3+i
5. **Cube is the planar surfaces bounding crystal faces equall:**
6. **Based on external symmetry crystals classified into number of classes equall:**
   (A) 64 (B) 16 (C) 32 (D) 7
7. **A combination of 4-fold, 3-fold and 2-fold rotation axes only occur in:**
   (A) Hexagonal (B) Tetragonal (C) Cubic (D) Trigonal
8. **Isometric crystals have a greatest symmetry functions, while the least symmetry functions occurs in:**
   (A) Monoclinic (B) Trigonal (C) Ticlinic (D) Orthorhombic
9. **Six – fold and two-fold rotation axes are common on:**
   (A) Tetragonal (B) Trigonal (C) Hexagonal (D) Isometric
10. **In dimetric crystals, the crystal axis that has different length is:**
    (A) a-axis, (B) c-axis, (C) b-axis, (D) all unequal

II. Write the number of faces and label the Miller indices SYMBOLES for the following crystal forms:

1. Tetragonal bipyramid
2. dihexagonal prism
3. Dome a
4. Hexaoctahedron
5. Ditrigonal scalenohedron
6. Tetragonal prism
7. Basal pinacoid
8. Trioctahedron
9. Front pinacid
10. Dodecahedron

III. Prove with drawing that rotoinversion axis (bar 6) has the equivalent effect of 3/m symmetry functions:

Part Two (Mineralogy)

I. Choose the correct answer from A,B,C,D (10 pts)

1. Which of the following is representative of the formula for K-feldspar?
   (A) $NaAlSi_3O_8$ (B) KAlSi3O8 (C) $CaMg(CO_3)_2$ (D) $(Ca,Na)(Al,Si)AlSi_2O_8$
2. Which of the following is representative of the formula for quartz?
   (A)SiO_2 (B) $CaCO_3$ (C) NaCl (D)$NaAlSi_3O_8$

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3. It is highly recommended to use the mechanical method to extract siliceous microfossils.

4. Members of Endocochlia Cephalopods hold significant geological importance due to their ability to form exoskeletons.

5. Echinodermata shows a pentameral symmetry in the earlier stage of growth.

B. Choose the correct answer (5 degrees, 1 each).

1. Foraminifera multi-chambered tests first appeared in ..... Period.
A. Devonian B. Triassic C. Cambrian D. Jurassic

2. ..... is important primary producers in the marine ecosystem
A. Foraminifera B. Graptolites C. Coccolithophores D. Bivalves

3. Members of Heteractinellida sponge completely disappeared in ..... Period
A. Carboniferous B. Triassic C. Jurassic D. Cretaceous

4. Irregular echinoids are characterized by having ..... mode of life
A. in-faunal B. epi-faunal C. planktonic D. nektonic

5. .....is the branch in paleontology focused on studying the evolution, adaptation of the fossils throughout the geologic time.
A. Palynology B. Palaeobiology C. Phylogeny D. Ontogeny

Fourth question (10 degrees, 5 degrees each)
Compare between the following

1. Brachiopods and Bivalvia

2. Holoococcolith, heterococcolith, and nannolith

Fifth question (10 degrees, 5 degrees each)
Write on the following

1. Formation of septa in rugosa, please support your answer by drawing.

2. Morphological features of Echinoids.

انتهت الأسئلة.....بالتوفيق والنجاح

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

First Semester Final Examination
Geology Students
(Invertebrate Paleontology)

January 2025	G215	50 Marks	Time: 2 hours

ملحوظة: الامتحان يتكون من ورقة واحدة على الوجهين

Answer the following questions

First question (5 degrees, 1 degree each)
Write the scientific term in front of the following definitions

1. Processes between death and burial that associated with disarticulation, weathering, and transport of the dead organism.
2. Fossil assemblage that is composed of components moved from their positions but not transported to a new community.
3. Site in coccolithophores that is responsible for coccolith formation.
4. A process in the fossilization journey that takes place when ground water carrying dissolved minerals infiltrates the microscopic pores and cavities in shells.
5. Description of the origin and the development of an organism from the fertilized egg to its mature form.

Second question (15 degree, 5 degrees each)

1. Explain why shell preservation is maximized in anaerobic conditions.
2. Explain why codes of biological nomenclature are important.
3. The lysocline and carbonate compensation depth (CCD) are two marine phenomena that are mostly not equivalent, define and explain.

Third question (10 degrees)

A. Put true or false in front of the following sentences (5 degrees, 1 each).

1. Taphocoenosis is defined as an assemblage where all fossil species live in the same community.
2. Calcareous nannoplankton established their first occurrence in Permian Period.

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