

Assiut University
Faculty of Science
Department of Geology



Date: June 2023
Time allowed: 2 hours

Final Exam

Principles of Geophysics (PG 253), Total of 50 Marks

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

Statement	TRUE (✓)	FALSE (X)
1. Geophysics comes in two basic flavours, Pure Geophysics and Applied Geophysics		
2. In Pure (Academic) Geophysics we are studying various Earth processes from a theoretical physics approach		
3. In mining geophysics, geophysical methods are used for groundwater exploration		
4. The measured parameter in seismic refraction survey is the travel times of refracted seismic energy		
5. The measured parameter in electrical resistivity method is the potential difference in response to induced currents		
6. Geology is limited to the surface of the Earth however Geophysics adds information about the 3 rd dimension		
7. Geophysics does not replace traditional geologic study; it compliments it.		
8. Electrical geophysical prospecting methods detect the surface effects produced by electric current flow in the ground		
9. Electrical resistivity is a passive method whereas self-potential is an active method.		
10. Electronic conduction occurs in materials containing free electrons such as the metal		
11. Electrolytic conduction is faster than electronic conduction and occurs in fluids		
12. In dielectric conduction atomic electrons are displaced slightly to their nuclei		
13. The SI unit of electrical conductivity is siemens per meter		
14. Electrical conductivity is defined as the measure of a material's ability to permit electric current flow		
15. With increasing water content, the electrical resistivity of earth materials increases		

16. With increasing salinity of water in rocks and sediments, the electrical conductivity increases		
17. Porosity is one of the fundamental factors controlling the electrical resistivity of sedimentary rocks		
18. The presence of clay will decrease the electrical resistivity in rocks and sediments		
19. Sediments and sedimentary rocks are less resistive than unweathered igneous and metamorphic rocks		
20. Resistivity increases with increasing metallic minerals content		
21. Fracturing and other permeability enhancing processes (e.g., jointing, weathering, dissolution) decrease resistivity		
22. Clays and shales have lower resistivity than sand-gravel mixtures and sandstones, especially if the pore water is fresh		
23. Freshwater saturated rocks are more resistive than brine saturated rocks		
24. Orebodies are much less resistive than the surrounding host rocks		
25. Apparent resistivity is defined as the resistivity of an equivalent but fictitious half space and depends on electrode geometry and spacing		
26. True resistivity is defined as the resistivity of the subsurface when it is inhomogeneous and anisotropic and can be estimated from data inversion		
27. In wenner electrode array the vertical resolution of resistivity data is much better than Schlumberger and dipole-dipole array		
28. Schlumberger array is best suited for vertical electrical sounding survey		
29. Electrical profiling is best suited to map lateral electrical resistivity contrasts, such as lithologic contacts		
30. By increasing the electrode spacing, more of the injected current will flow to shallower depths		
31. In sounding-profiling field survey we can get information about the vertical and lateral variation in electrical resistivity		
32. The interpretation of resistivity data cannot yield information about true resistivity and depths to layer interfaces		
33. One of the advantages of electrical resistivity method is that it is less costly than drilling		

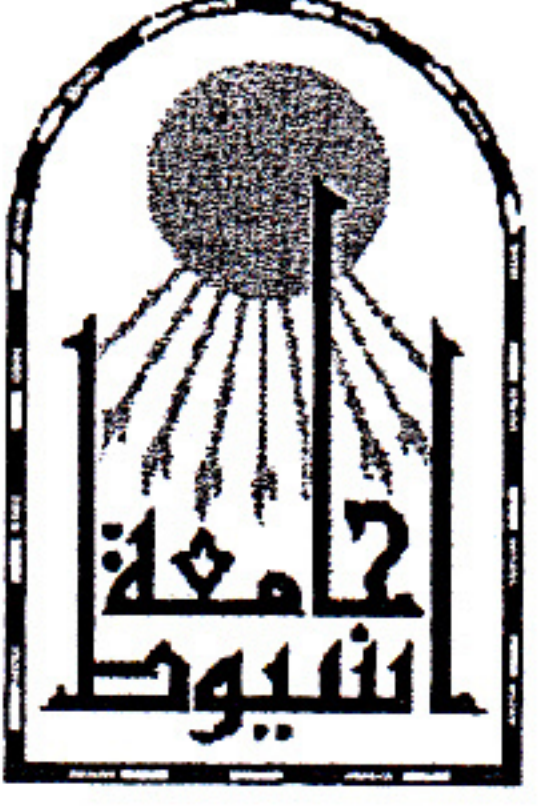
34. One of the disadvantages of electrical resistivity method that the electrodes must be in a good contact with soil		
35. Electrical resistivity measurements may be limited by either highly conductive or highly resistive surface soils		
36. Electrical resistivity method is best suited for groundwater exploration		
37. Electrical resistivity can be used to map salt-water intrusion		
38. Water filled voids will display a conductive response compared to air filled voids		
39. Spontaneous polarization method is based on the surface measurement of natural potentials resulting from electrochemical reactions in the subsurface		
40. The sign of the self-potential is an important diagnostic factor in the interpretation of SP anomalies		
41. Electrokinetic potentials result from the flowing of fluid through a capillary or porous medium		
42. The self-potentials are almost invariably negative over the top of the sulfide deposit and are quite stable in time		
43. The interpretation of SP is mostly quantitative		
44. Topography can result in high negative SP anomaly up to 2 V		
45. Sato and Mooney (1960) have provided the most complete explanation of the electrochemical processes caused the mineral SP anomalies		
46. Self-potential can be used to map the locations of water seepage in dams		
47. Seismic wave is defined as the transfer of energy by way of particle motion		
48. The higher the value of the modulus, the stronger the material, and the smaller the strain produced by a given stress		
49. Primary seismic waves are slower than secondary seismic waves		
50. Secondary seismic waves can travel through liquids		

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

End of questions

Good luck.....

Instructor: Prof. Dr. Gamal Zidan Abdelaal



Q1: Shade (T) for True statements or (F) for False statements (30 marks; 1mark each)

- 1- The principle of original horizontality means that horizontal layer was deposited initially inclined.
- 2- Lithostratigraphy deals with correlation of faunal successions.
- 3- Surface geology usually offers all details of the buried geological phenomena.
- 4- Major stage boundaries are defined on the basis of global events.
- 5- Abundance zones can be correlated on an interregional scale.
- 6- Sedimentary rocks can rarely be dated directly by radiometric techniques.
- 7- Carbon and oxygen isotopes can be applied in stratigraphy.
- 8- Species that overlap through space and time are used in biostratigraphic zonation.
- 9- Cross-bedding is clear evidence of superposition.
- 10- Long ranging fossils are usually index fossils.
- 11- Geochemistry (e.g. radioactive carbon isotopes) is used to infer ages of organic-bearing sediments.
- 12- Lithostratigraphic units can result from changes of lithology.
- 13- Stratigraphy concerns the study of any rock type of stratified nature.
- 14- Faunas such as foraminifers are sometimes essential physical constituents of rocks.
- 15- Conformable layers represent periods of erosion and/or non deposition.
- 16- Shape of geophysical logs can reflect types of depositional environments.
- 17- In biostratigraphy rare fossil species can be significant in correlation and age-dating of sedimentary rocks.
- 18- Soil units are termed "magnetostratigraphic units".
- 19- Species can be applied in stratigraphic resolution.
- 20- Stable sea level means that sediment accumulation and subsidence are in equilibrium.
- 21- All criteria of superposition are stratigraphic.
- 22- The principle of "uniformitarianism and catastrophism" explains sudden changes in fossil associations known as mass extinctions.
- 23- In biostratigraphy we use magnetic properties to establish relative ages.
- 24- Drilling is one of the most important indirect sources of information in subsurface stratigraphy.
- 25- The type locality refers to all geographic localities where the stratotype of a given stratigraphic unit is present.
- 26- By applying the principle of superposition or cross-cutting relationships ages can be bracketed between underlying and overlying datable horizons.
- 27- Few subsurface logs can provide full details of lithology.
- 28- Normal vertical faunal changes can determine boundaries of major chronostratigraphic units.
- 29- In lithostratigraphic correlation, rock units can be either diachronous or isochronous.
- 30- Unconformities are important stratigraphic evidences of superposition.

Q2: Shade the correct answer; A, B, C or D (20 marks; 1mark each)

- 31- Layered strata that deposit nearly parallel to the Earth's surface belongs to the law of.....
A- superposition B- inclusion C- initial horizontality D- strata continuity
- 32- Ancient physical processes are working today; this doctrine is termed
A- provincialism B- uniformitarianism C- catastrophism D- metamorphism
- 33- Sedimentary facies overlap vertically as result of
A- sea level fluctuations B- weathering C- truncation D- erosion
- 34- Sometimes stratotypes can be inaccessible, a determination of an alternative is termed
A- Holostratotype B- Parastratotype C- Neostratotype D- none of them
- 35- One of the following is not a wireline log:
A- temperature B- paleontologic C- Gamma ray D- dipmeter

- 36- In routine lithostratigraphic work geologists apply mainly the
- A- physical properties of rocks
 - B- fossil content and chemical properties of rocks
 - C- primary sedimentary structures
 - D- secondary structures
- 37- Gradational contacts between rock units form due to
- A- monotonous lithology
 - B- gradual change in lithology
 - C- non-deposition
 - D- erosion and re-sedimentation
- 38- In caliper logs we measure
- A- fluids
 - B- depths
 - C- resistivities
 - D- hole diameter
- 39- By applying the principle of uniformitarianism without the "catastrophism" approach, features such as cannot be reliably understood.
- A- faunal successions
 - B- disappearance of species
 - C- abrupt fossils turnover
 - D- appearance of new species
- 40- Which of the following conforms to law of superposition?
- A- Marker bed found on both valley sides
 - B- Igneous rocks invaded by dykes
 - C- Interbedded sediments
 - D- Intertonguing sediments
- 41- Lithostratigraphic units can be distinguished by their.....
- A-lithologic types
 - B- chemical composition
 - C- fossil content
 - D- structural relationships
- 42- Surface or subsurface stratigraphic units bounded by unconformities have been incorporated recently in the stratigraphic work, they are named units.
- A- biostratigraphic
 - B- cyclostratigraphic
 - C- pedostratigraphic
 - D- allostratigraphic
- 43- Apparent concordance between rock layers identifies
- A- angular unconformity
 - B- paraconformity
 - C- disconformity
 - D- nonconformity
- 44- The contact between two beds of similar attitudes is most likely a surface of
- A- angular unconformity
 - B- erosion
 - C- disconformity
 - D- nonconformity
- 45- What is the correct order, from oldest to youngest, of the following geologic Systems/Periods?
- A- Jurassic, Triassic, Cretaceous
 - B- Cretaceous, Triassic, Jurassic
 - C- Triassic, Cretaceous, Jurassic
 - D- Triassic, Jurassic, Cretaceous
- 46- The following methods are used in rock correlations except of
- A- physical similarity
 - B- time equivalency
 - C- fauna/flora succession
 - D- rock fabrics
- 47- Disconformity surfaces differ from those of the paraconformities by being
- A- of shorter time span
 - B- more or less regular
 - C- of longer time span
 - D- obviously irregular
- 48- Lower Triassic rock layers correspond and refer to
- A- earliest Triassic
 - B- Early Triassic
 - C- lowest Triassic
 - D- earliest Late Triassic
- 49- The smallest widely used chronostratigraphic unit is termed
- A- System
 - B- Stage
 - C- Erathem
 - D- Series
- 50- Glacial varves are used to correlate
- A- Non-glacial deposits
 - B- lake deposits
 - C- carbonate deposits
 - D- none of these

انتهت الأسئلة

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

Geology Department Faculty of Science Assiut University		قسم الجيولوجيا كلية العلوم جامعة أسيوط
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Second Semester Final Examination
Geology Students, 2nd Level
(Vertebrate Paleontology and Origin of Species)

June 2023	G 216	50 Marks	Time: 2 hours
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ملحوظة هامة: الامتحان يتكون من ورقتين على الوجهين

Part 1: Vertebrate Paleontology (25 degree)

Answer the following questions.

Q1: Write on Two only of the following (10 marks; 5 marks each)

1. The key characteristics of Chordates.
2. The transition of the amphibians from water to land was not an easy task; **explain**, and how the amphibians found ways to correct these problems?
3. *Tiktaalik roseae* considers the missing link between the fishes and amphibians, what was the most important feature of it?

Q2: Write on Two only of the following (10 marks; 5 marks each)

1. The realm of paleoecology considers one of the most important stages in vertebrate taphonomy, **explain**.
2. Placoderms are considered the most primitive jawed fishes, describe the main characteristics of it and what is the possible theory for the origin of jaws?
3. *Acanthostega* and *Ichthyostega* were the oldest tetrapods discovered, what are the similarities and differences between them?

Q3: State whether the following statements are correct or wrong (5 marks, 1 mark each)

- 1- Pterosaurs existed from the late Triassic to the end of the Cretaceous Period.
- 2- The limbs of the earliest Tetrapods first evolved for walking on land.
- 3- Acanthodians jaws fish ranged from Silurian to Permian Period.
- 4- Anapsid is an ancestor of the first turtles, which appeared in the Triassic.
- 5- The adult forms of Subphylum Cephalochordata show chordate features.

Part II: Origin of Species (25 degrees)

Answer the following questions

1- Write briefly on TWO only of the following: (10 marks; 5 marks each)

- A- Differentiate between the Shannon-Wiener index and Simpson index.
- B- Prezygotic reproductive isolation.
- C- Mechanism of species evolution.

2- Define FIVE Only of the following: (10 marks; 2 marks each)

- A- Hybrid sterility, B- Prokaryotes, C- Natural selection, D- Microevolution,
- E- Genetic drift, F- Ecological species concept, G- Specie richness.

3- State whether the following statements are correct or wrong and correct the wrong one: (5 marks; 1 mark each)

- A- Dominance indices are heavily weighted towards the commonest species, but it can be used to indicate species diversity.
- B- Behavioral isolation means that two species live in different habitats have a good chance of interaction.
- C- In statistic, population means all individuals of a species interact with one another to maintain a homogenous gee pool.
- D- Homologous structures represent a strong evidence of a common ancestor.
- E- Species richness (*S*) is very sensitive to sample size.

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

Good Luck

Prof. Dr. Amr S. Deaf

Assoc. Dr. Amr A. Abdelhamid

*Assiut University
Faculty of Science
Geology Department*



*June 2023
Time: 2 hours*

Level two examinations

Course No. (G234)

Mark right (✓) or (×) wrong: (30 Marks)

1. () *Five planes of Symmetry are found in tetragonal system.*
2. () *Prism is an open form.*
3. () *$\{221\}$ is a general form.*
4. () *$\{110\}$ is a prism.*
5. () *Hexagonal prism can be found in trigonal system.*
6. () *$\{12\bar{1}0\}$ is a possible index.*
7. () *The a-dome cuts only the c-axis.*
8. () *The c-pinacoid may be found in all systems.*
9. () *Prisms always parallel c – axis.*
10. () *Bipyramids always cut all axes*
11. () *$\{10\bar{1}1\}$ is b – dome.*
12. () *Rhombohedral has 6 faces.*
13. () *$\{211\}$ is a – dome.*
14. () *$\{101\}$ in tetragonal is bipyramid.*
15. () *$\{111\}$ is a general form.*
16. () *$\{101\}$ in tetragonal is first order bipyramid.*
17. () *$\{100\}$ in tetragonal is front pinacoid.*
18. () *$\{110\}$ in tetragonal is first order prism.*
19. () *$\{221\}$ is a special form.*
20. () *$\{11\bar{1}0\}$ is a hexagonal prism.*
21. () *Bipyramids are always closed forms.*
22. () *Becke – line is an optical property.*
23. () *Black cross on white field is uniaxial interference figure.*
24. () *Interference colours are observed in plane polarized light.*

25. () Polarizing microscope has only one polarizing plate.
 26. () Optical orientation is 3D body representing refractive indices.
 27. () Extinction in dimetric crystals is parallel.
 28. () Twinkling is caused by double refraction.
 29. () Change of relief is called pleochroism.
 30. () Indicatrix is a representation of refractive indices

Mark the proper choice to fill the space: (20 Marks)

31. The a-dome is
 a) Special form b) Open form c) Both
32. The number of symmetry elements in hexagonal is
 a) 13 b) 14 c) 15
33. Open forms in the cubic system are
 a) 2 b) 6 c) None
34. $\{100\}$ is an index of
 a) Tetragonal prism b) a – pinacoid c) Both
35. $\{101\}$ in orthorhombic is
 a) Open form b) General form c) Both
36. Bipyramid is form.
 a) Tetragonal b) Orthorhombic c) Both
37. $\{101\}$ is order bipyramid.
 a) First b) Second c) Third
38. Dome is form.
 a) Orthorhombic b) Tetragonal c) Both
39. Orthorhombic is a system.
 a) Dimetric b) Trimetric c) Isometric
40. The cube has planes of symmetry.
 a) 3 b) 6 c) 9
41. Domes are found in Systems.
 a) Dimetric b) Trimetric c) Isometric
42. $\{12\bar{3}1\}$ is
 a) Ditrigonal scalenohedron b) Dihexagonal bipyramid c) Both
43. Which system has 2 equal axes
 a) Tetragonal b) Orthorhombic c) Cubic

44. Twinkling is the change of
a) Grain colour b) Grain boundaries c) Grain shape
45. Colour is a result of
a) Double refraction b) Absorption c) Both
46. An ellipsoid of rotation is the indicatrix of
a) Dimetric crystals b) Isometric crystals c) Trimetric crystals
47. Interference colours are observed in
a) Crossed nicols b) Plane polarized light c) Both
48. Relief is affected by
a) RI of grain b) RI of medium c) Both
49. Pleochroism is the change of
a) Relief b) RI c) Colour
50. Extinction in uniaxial crystals is
a) Parallel b) Symmetrical c) Both

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الساعة ١١.٣٠ بمدرج رقم ١٠.

Final Exam for Rock – Forming Minerals (G 230)

Prof. Dr. Fawzy Farahat

Second Semester, June 2023

Time allowed: 2 Hours

A. Choose the Correct answer:**Total Points=50**

1. Sillimanite, Zircon and Staurolite minerals are examples of: (2 points)

a. Inosilicates, b. Phyllosilicates, c. Orthosilicates d. Sorosilicates e. Cyclosilicates

2. Wollastonite mineral is belongs to: (2 points)

a. Amphibole b. Disilicate c. pyroxene d. sheet silicate e. pyroxenoid

3. Antigorite and Kaolinite minerals are example of: (2 points)

a. TOT b. TOT+C c. TO d. TOT+O Structures .

4. The general formula of silicate ion presents in disilicates is: (2 points)

a. $(\text{SiO}_4)^{4-}$ b. $(\text{Si}_2\text{O}_5)^{2-}$ c. $(\text{Si}_2\text{O}_7)^{6-}$ d. $(\text{Si}_n\text{O}_{3n})^{2n-}$ e. $(\text{Si}_2\text{O}_5)^{4-}$

5. β -Quartz is low-temperature and low symmetry? (2 points)

a. True b. False

6. Feldspars are 3-D framework silicates, while clintonite and margarite are sheet silicates.

a. True b. False (2 points)

7. Match minerals in group I with the corresponding silicate structure in group II. (2 points)

Group I

Group II

Zircon

Sorosilicates

Anthophyllite

Nesosilicates

Labradorite

Double chain silicates

Epidote group

Tectosilicates

8. Arrange the following minerals which crystallized from the magma according to the decreasing order of temperature (From high to low temperature). (2 points)

a. Hornblende b. pyroxene c. biotite d. olivine e. quartz f. orthoclase

B. Fill the spaces with scientific terms:

9. Chemical formula of Garnet group isand the garnet minerals are classified into two groups named as and (2 points)

10. Define the isomorphism..... and give example of isomorphous minerals..... (2 points)

11. What is the mineral hold only by covalent bond?(2 points)

12. Which mineral of the silica group is found only in extremely high pressure?

The mineral is (2 points)

13. Pyroxene and amphibole are classified into ortho- or clino pyroxene/amphibole according to the identity of structural site.....in pyroxene and structural site.....in amphibole. (2points)

14. Draw the structure of silicate ion $(\text{Si}_2\text{O}_5)^{2-}$. (2 points)

15. Draw the structure of silicate ion $(\text{Si}_2\text{O}_6)^{4-}$. (2 points)

C. Write briefly on the following:

16. What is the structure of chlorite and write the steps for its formation ?. (5 points)

17. How TOT I-beam structure of pyroxene is formed?

Answer with drawing

(5 points)

18. How TOT strips of amphibole are formed?

Answer with drawing

(5 points)

Optical Mineralogy (235 G)

Indicate by the sign (✓) or (×) (50 marks):

- 1-Metallic oxides (ores) is black ()
- 2-Metallic oxides have crystals refract light ()
- 3-The absorption is always proportional to the thickness of the crystal ()
- 4-When the absorption of light is homogenous in all the wave lengths, the crystal appears to be white ()
- 5-The absorption increases, the crystal gradually appears to be grayish ()
- 6-Colourless minerals in thin section have white light passes unaffected through the mineral ()
- 7-Colourless minerals in thin section have no of its wavelengths is absorbed ()
- 8-Opaque minerals (metallic ores) all wavelengths are absorbed ()
- 9-Habit is depending on the orientation of the grain ()
- 10-Cleavage is related to planes of weakness in atomic structure of the minerals ()
- 11-Cleavage is **good** developed it is called partings ()
- 12-The number of cleavages seen depends upon the **shape** of the mineral section ()
- 13-A portion of a single **euhedral** crystal of calcite showing rhombohedral cleavage ()
- 14-Quartz have irregular fractures and they do **show** cleavage ()
- 15-Relief is **negative** when the grain has higher refractive index than its surroundings, negative if lower ()
- 16-The refractive index of **some** anisotropic minerals is depending on the vibration direction of the light within the crystal ()
- 17-Refractive index (N) of Canada balsam is 1.74 ()
- 18-Refractive index of garnet mineral =1.88 ()
- 19-Refractive index of halite mineral =1.54 ()
- 20-Refractive index of fluorite mineral =1.43 ()
- 21-Ordinary ray have refractive index > Refractive index of medium ()
- 22-Extraordinary ray have Refractive index = refractive index of medium ()
- 23-Sanidine is° with simple twin ()

- 24-Orthoclase is with simple twin ()
- 25-Biotite has one cleavage ()
- 26-Pyroxene has two cleavages ()
- 27-Amphiboles have two cleavages ()
- 28-Olivine has a parting ()
- 29-Polysynthetic twinning (albite twinning) is present in plagioclase ()
- 30-Cross-hatching twinning is occur n microcline ()
- 31-Is an albite, simple, and pericline twinning occur in **biotite** ()
- 32-Minerals whose optical orientations are **uniaxial** ()
- 33-**Biaxial** not has optical orientations ()
- 34-The variation in interference colour which the grains of a certain mineral present depends on the **shape** of the grain ()
- 35-The interference colour varies from nil for the **vertical cut** to a maximum value represented by the vertical cut, passing through a series of intermediate colours corresponding to the inclined cuts ()
- 36-Different intermediate colours of grains of **different mineral** are due to different orientations ()
- 37-The limit between the various orders interference colour is fixed in the mixture between violet and **green** ()
- 38-Minerals with relatively weak color like chlorite, or actinolite, will show interference colors **very different** from colorless minerals ()
- 39-Minerals that have **cleavage** or elongation not have an extinction angle ()
- 40-Minerals with undulose extinction, solid solution/zonation, or other factors that may inhibit this measure and **may be use** ()
- 41-Minerals belonging to the tetragonal, hexagonal, trigonal or orthorhombic crystal systems will in general show straight extinction ()
- 42-Minerals belonging to the monoclinic system will often show inclined extinction but may sometimes show straight extinction ()
- 43-Extinction behavior is a function of the relationship between indicatrix orientation and crystallographic orientation ()
- 44-All uniaxial minerals show parallel extinction ()
- 45-Orthorhombic minerals show parallel extinction ()
- 46-Monoclinic minerals: indicatrix axes do not coincide with crystallographic axes ()
- 47-These minerals have inclined extinction and extinction angle helps to identify them ()
- 48-The indicatrix is a sphere of the isotropic mineral ()
- 49-The birefringence of the isotropic mineral is zero ()
- 50-The retardation of the isotropic mineral is zero ()

Oral Exam (10)

- 51-Every ellipsoid has at least **two** circular cross-section of the isotropic mineral ☐
- 52-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 ☐
- 53-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 ☐
- 54-**Biaxial** materials have one principal symmetry axis and are tetragonal, hexagonal, or trigonal ☐
- 55-Birefringence and thickness both **decrease** uniformly with increasing angle from the optic axis of uniaxial mineral ☐
- 56-There are one optic axis of **biaxial** minerals ☐
- 57-Biaxial minerals are **cubic**, monoclinic or triclinic ☐
- 58-Isotropic mineral do **give** interference figures ☐
- 59-When $2V$ is acute about Z: (+) ☐
- 60-When $2V$ is acute about X: (-) ☐

Good luck

Prof. Dr. Mohamed Abd El-Raouf Hassan

Crystallography and Mineralogy (231 G)

Answer the following quations: (50 marks)

1-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 bipyramidform ()
- 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 ()
- 26-Pyroxene is content OH ()
- 27-Olivine is content OH ()
- 28- α - quartz is stable at atmospheric temperature and up to 573°C ()
- 29- β -quartz is stable from 573° to 870°C ()
- 30- β -cristobalite can exist above 200° - 275°C and is stable from 1470° to 1713°C ()
- 31-The substitution of Al^{+3} for Si^{+4} in quartz ()
- 32-The substitution of Fe^{+3} for Si^{+4} in quartz ()
- 33-Quartz develops undulatory extinction due to strain ()

- 34-General formula of mica group $(\text{Si}_4\text{O}_{10})^{4-}$ ()
- 35-Fluorite is halide ()
- 36-Halite is distinguished by its cubic cleavage ()
- 37-Serpentine group are polymorphs ()
- 38-Feldspar is a common raw material in the production of ceramics ()
- 39-The extinction angle is an optical characteristic and varies with the albite content ()
- 40-Twinning in plagioclase is multiple lamellar albite or simple carlsbad ()
- 41-Twinning in orthoclase is multiple lamellar albite ()
- 42-Twinning in microcline is simple carlsbad ()
- 43-Twinning in sanidine is simple carlsbad ()
- 44-The intergrowth of K-feldspar and plagioclase as the dominant phase or host is termed antiperthite ()
- 45-The intergrowth of plagioclase and K-feldspar as the dominant phase or host is termed antiperthite ()
- 46-Anorthoclase may be distinguished by its tartan twinning (cross-hatched) ()
- 47-Clay group consists of hydrous aluminum layered silicates ()
- 48-Mica group are monoclinic system ()
- 49-Hornblende is content OH ()
- 50-Mica is content OH ()

Oral Exam. (10 marks)

CHOOSE THE CORRECT ANSWER OF THE FOLLOWING

- 1-Prism form is: a-open b-closed
- 2-First order prism has miller index: a-110 b-100 c-hko
- 3-Ditetragonal prism has miller index: a-110 b-100 c-hko
- 4-Bipyramid is: a-open b-closed c-compound
- 5-Ditetragonalbipyramid has: a-12 faces b-8 faces c-16 faces
- 6-Trapezohedron is: a-closed form b-open form
- 7-Scalenohedron is: a-closed form b-open form
- 8-Rhombohedral form have: a-3 faces b-6 faces c-8 faces
- 9-Mineral crystal in octahedron form is a-fluorite b-pyrite
c-galena d-all of the above
- 10-A dome form is: a-open b-closed



2022/2023 Second Semester, Final Examination

On: Geographic Information System (G-240)

Time: 2 hours

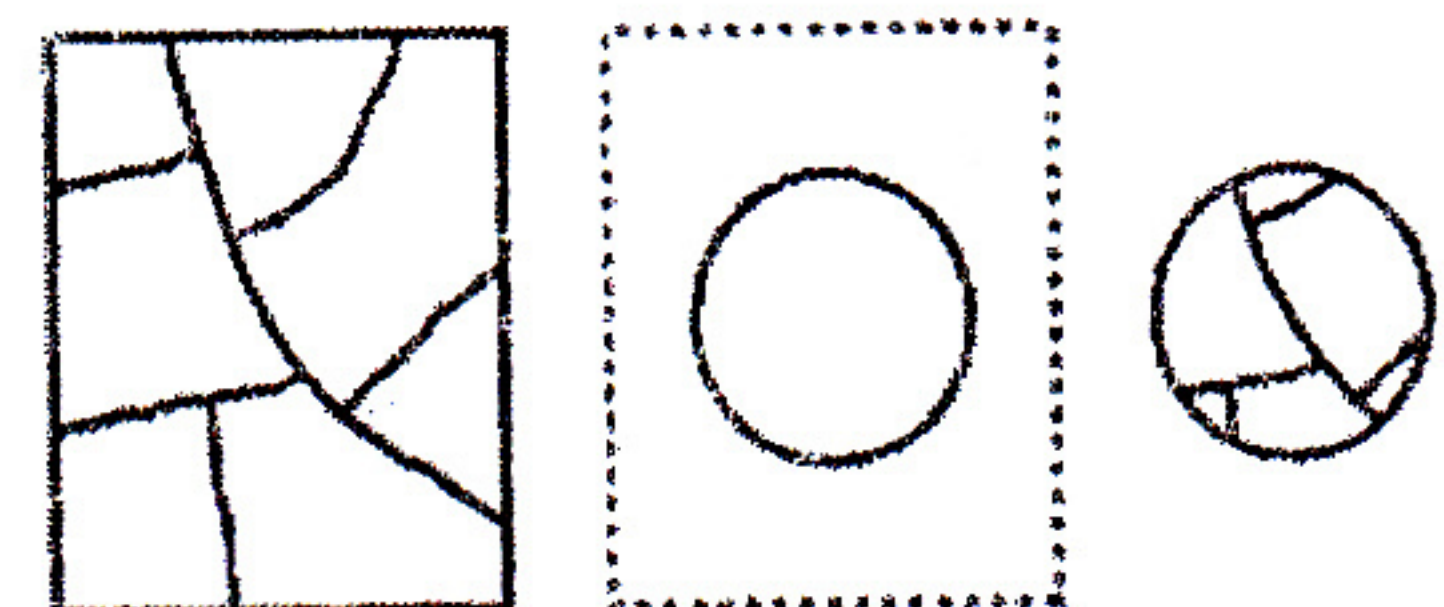
Answer the following questions:

First Question: Choose the correct answer:

(30 marks; one mark each)

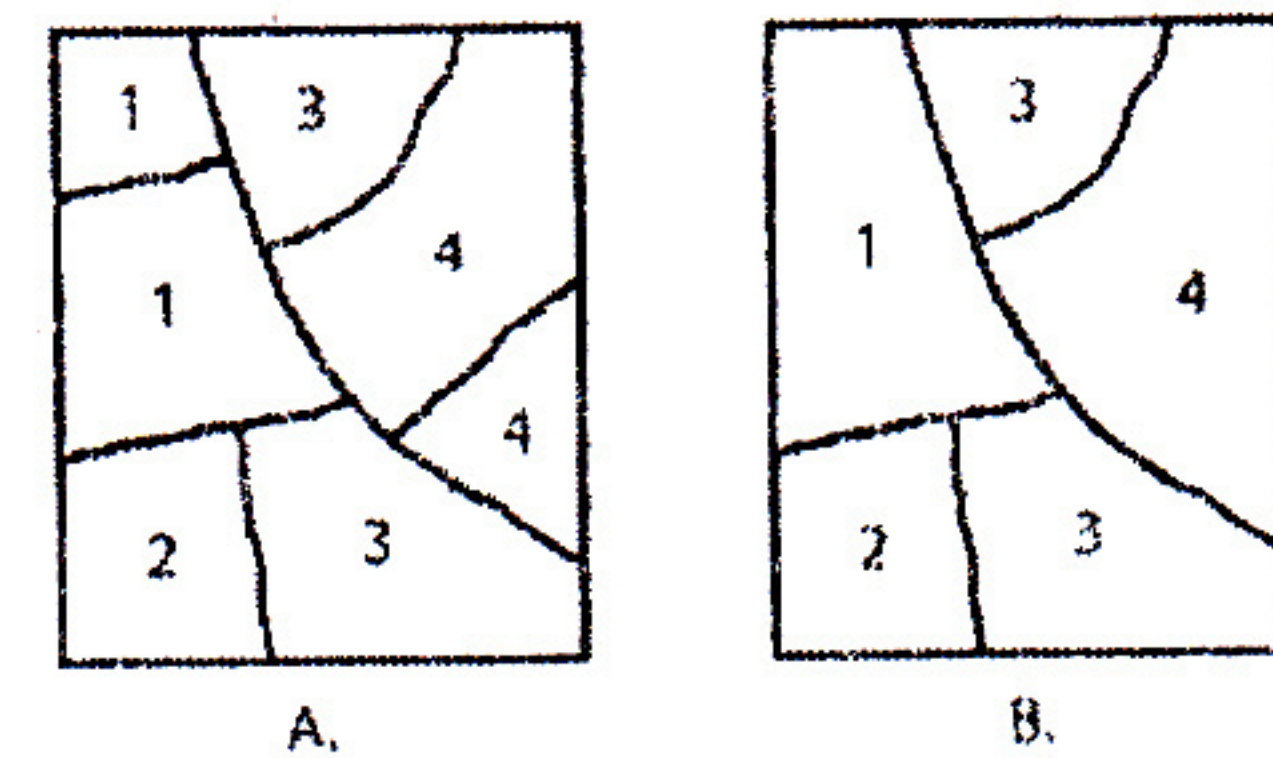
1. The raster data model consists of rows and columns of equally sized _____ interconnected to form a planar surface.
a) points b) lines c) grids d) pixels
2. _____ occur when the shared boundary of two polygons does not meet exactly.
a) Overlaps b) Slivers c) Gaps d) Symmetrical difference
3. _____ is measured relative to the equator at zero degrees, with maxima of either 90 degrees north at the North Pole or 90 degrees south at the South Pole.
a) Longitude b) Prime meridian c) Latitude d) UTM coordinate
4. UTM coordinate system divides the globe into 60 N/S zones, each _____ wide.
a) 4° longitudes b) 6° longitudes c) 8° longitudes d) 10° longitudes
5. _____ are 2D features created by multiple lines that loop back to create a closed feature. They are used to represent geologic formations, lakes, or vegetation.
a) Polygons b) Points c) Lines d) Vertices
6. In the Egyptian Transverse Mercator (ETM) projection system, Egypt was divided into _____ belts/zones.
a) two b) three c) four d) five
7. Which of the following statements is true about the capabilities of GIS:
a) Data capture and preparation b) Data management, storage and maintenance
c) Data manipulation, analysis, and presentation d) All of them
8. Each Universal Transverse Mercator (UTM) zone divided into _____ East/West bands, each 8° high lettered from the south pole using C through X letters.
a) twenty b) twenty-one c) twenty-two d) twenty-three
9. Among the following, _____ can be expressed as an example of hardware component.
a) keyboard b) Auto CAD c) ArcGIS d) digitalization
10. The X-value, called the Easting, has a value of _____ at the central meridian of each zone in the UTM coordinate system.
a) 10,000,000 m. b) 1,000,000 m. c) 750,000 m. d) 500,000 m.
11. _____ satellites make use of sensors that detect the reflected or emitted electromagnetic radiation from natural sources.
a) Geostationary b) Sun-synchronous c) Active d) Passive
12. Polygons that can be drawn at a constant distance around every feature in a layer, or at a distance that varies according to attribute values are called _____.
a) overlays b) boundaries c) buffers d) none of them

13. If a certain location has the following geographic coordinates (longitude $39^{\circ} 10' 17''$ E and latitude $21^{\circ} 29' 55''$ N), the corresponding UTM zone will be:
 a) Q36 b) Q37 c) R36 d) R37
14. All the following refer to the surfaces that we normally use for the map projections except:
 a) The plane b) The cone c) The cylinder d) The sphere
15. A raster model with pixels representing 10 m. by 10 m. in the real world would be said to have a spatial resolution of _____
 a) 100 m. b) 20 m. c) 10 m. d) 1 m.
16. _____ resolution denotes the ability of the satellite's sensor to resolve wavelength intervals, also called bands, within the electromagnetic spectrum.
 a) Spectral b) Temporal c) Spatial d) Radiometric
17. _____ satellites circle the Earth proximal to the equator once each day. They yield high temporal resolution but low spatial resolution.
 a) Geostationary b) Sun-synchronous c) Polar d) None of them
18. City names such as New York, Tokyo, or London refer to _____ locations.
 a) nominal b) absolute c) relative d) none of them
19. Landsat-7 satellite maintains _____ radiometric resolution for its bands and can therefore record values for each pixel that range from 0 to 255.
 a) 4-bit b) 8-bit c) 12-bit d) 16-bit
20. _____ is the main latitude reference in the ETM projection system.
 a) Equator b) Latitude 22° c) Latitude 25° d) Latitude 30°
21. All the following are examples of spatial data except:
 a) Latitude and longitude coordinates b) Street address
 c) Zip code d) Geologic units
22. Universal Transverse Mercator (UTM) used from _____
 a) Latitudes 84° N to 84° S b) Latitudes 84° N to 80° S
 c) Latitudes 80° N to 84° S d) Latitudes 80° N to 80° S
23. A source of potential error in an aerial photograph is the _____ which arises from the three-dimensional aspect of terrain features.
 a) curvature b) orthophoto c) relief displacement d) error propagation
24. Zone 1 in the UTM system is from _____ longitudes.
 a) 180° W to 170° W b) 180° W to 160° W c) 180° W to 174° W d) 180° W to 164° W
25. In ArcMap, the _____ provides a page view where map elements such as the data frame, a scale bar, and a map title, are arranged on a page for map printing.
 a) data frame b) layout view c) table of contents d) symbology
26. Map projections could be classified to _____ in case considering the light source.
 a) normal, transverse, and oblique b) gnomonic, stereographic, and orthographic
 c) planar, cylindrical, and conical d) none of them
27. The opposite plot refers to _____
 a) erase b) clip
 c) split d) intersect



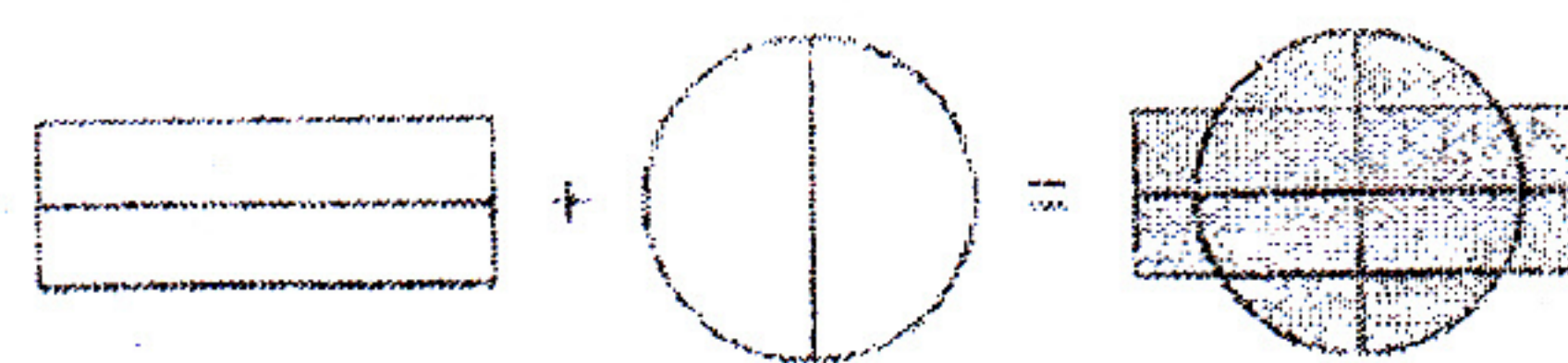
28. The _____ operation combines adjacent polygon features in a single feature dataset based on a single predetermined attribute.

- a) append b) dissolve
c) select d) merge



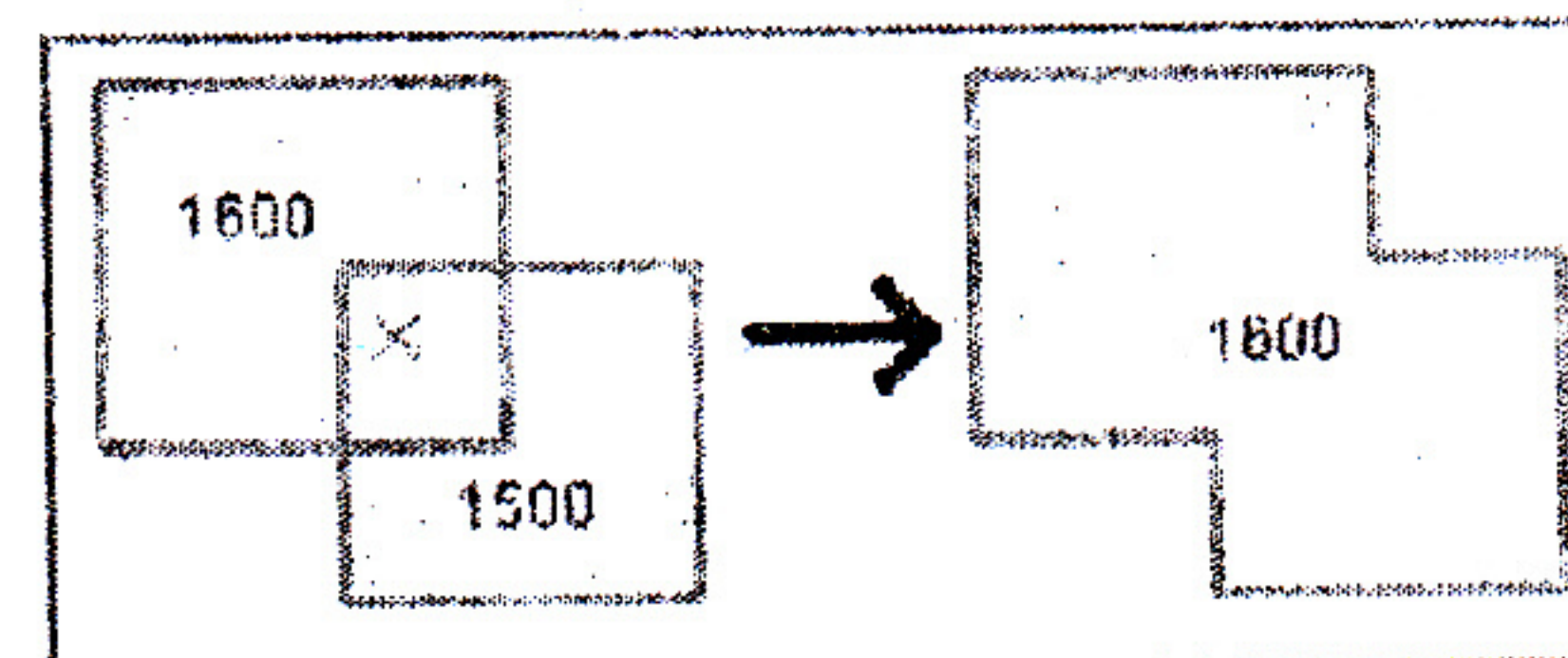
29. The opposite plot refers to _____ vector operation:

- a) union b) intersection
c) split d) symmetrical difference



30. The _____ operation combines features within a point, line, or polygon layer into a single feature with identical attribute information.

- a) append b) dissolve
c) select d) merge



Second Question: True or False:

(20 marks; one mark each)

31. The representative fraction describes scale as a simple ratio. The numerator denotes map distance, and the denominator denotes real-world distance. ()
32. The "table of contents" in ArcMap, lists all layers on the map and shows what the features in each layer represent. ()
33. An overlay is a process of taking two or more different thematic maps of the same area and placing them on top of one another to form a new map. ()
34. The "split" operation is used to divide an input layer into two or more layers based on a split layer. ()
35. When using decimal degrees, latitudes above the equator and longitudes east of the prime meridian are negative, while latitudes below the equator and longitudes west of the prime meridian are positive. ()
36. ArcCatalog is used to organize and manage various types of geographic information as logical collections. ()
37. The small-scale map shows more detail and less area, while the large-scale map shows more area but less detail. ()
38. Health records, soil description, and sample quality are examples of attribute data. ()
39. Examples of some common types of reference maps include topographic maps, aerial photographs, and satellite images. ()
40. GIS is a computer-based information system that enables the capture, storage, modeling, retrieval, analysis, and presentation of geographically referenced spatial data ()
41. The most prevalent GIS software comes from Environmental Systems Research Institute (ESRI). ()
42. The coordinate system that is most used to define locations on the 3D Earth is called the geographic coordinate system, and it is based on a spheroid. ()
43. Three fundamental vector types exist in GIS: points, lines, and polygons. ()
44. "Capture" means getting the real world into the GIS through digitizing. ()

45. In order to determine direction, a reference point or benchmark from which direction will be measured needs to be established. ()
46. True north refers to the point on the surface of the earth where the earth's magnetic fields converge. ()
47. Grid north simply refers to the northward direction that the grid lines of latitude and longitude on a map, called a graticule, point to. ()
48. Map projections are mathematical formulas that are used to translate latitude and longitude on the surface of the earth to x and y coordinates on a plane. ()
49. The JPEG, BMP, and TIFF file formats are based on the raster data model. ()
50. Orthophotos are vertical photographs that have been geometrically "corrected" to remove the curvature and terrain-induced error from images. ()

Third Question: Choose the correct answer: (Oral)

(10 marks; one mark each)

51. The _____ resolution of a satellite image is the smallest distance between two adjacent features that can be detected in an image.
a) spectral b) temporal c) spatial d) radiometric
52. _____ refers to define and describe places in relation to other known locations. For instance, Cairo, Egypt, is north of Johannesburg, South Africa.
a) Nominal location b) Absolute location c) Relative location d) None of them
53. GPS technology consists of a constellation of _____ satellites that are orbiting the Earth and constantly transmitting time signals.
a) Twenty-four b) Three c) Twenty-three d) Four
54. _____ mean(s) putting the information in a database and maintaining access to it.
a) Capture b) Spatial Analysis c) Restore and retrieve d) None of them
55. The Mercator projection is an example of a _____ projection and is famous for distorting Greenland.
a) Conformal b) Equidistant c) Equal-area d) Equivalent
56. The global World Geodetic System of 1984 datum uses the _____ as the origin of the geographic coordinate system and is used for defining locations across the globe.
a) Sea level b) Ground elevation c) Centre of the Earth d) None of them
57. _____ refers to the factor of reduction of the world, so it fits on a map, and it can be represented by text, a graphic, or some combination of the two.
a) Map legend b) Map scale c) Coordinate system d) North arrow
58. _____ refers to the position of something relative to something else usually along a line.
a) Location b) Distance c) Direction d) Navigation
59. _____ maps are simply changeable or interactive representations of the Earth.
a) Thematic b) Mental c) Reference d) Dynamic
60. Online maps and GISs are _____ because we can zoom in and out at will.
a) Large-scale maps b) Small-scale maps
c) Scaleless maps d) None of them

== Good Luck,, ==

Assoc. Prof. Rashad Sawires

Crystallography (233G)

CHOOSE THE CORRECT ANSWER OF THE FOLLOWING

- | | | |
|--------------------------------|--------------|--------------|
| 1-Cubic system contain | | |
| a-3twofold | b-4twofold | c-6twofold |
| 2-Cubic system contain | | |
| a-3threefold | b-4threefold | c-6threefold |
| 3-Cubic system contain | | |
| a-3fourfold | b-4fourfold | c-6fourfold |
| 4-Cubic system contain | | |
| a-5planes | b-4planes | c-9planes |
| 5-Tetragonal system contain | | |
| a-3fourfold | b-2twofold | c-1fourfold |
| 6-Tetragonal system contain | | |
| a-5twofold | b-4twofold | c-1twofold |
| 7-Tetragonal system contain | | |
| a-5planes | b-2planes | c-4planes |
| 8-Hexagonal system contain | | |
| a-5twofold | b-4twofold | c-6twofold |
| 9-Hexagonal system contain | | |
| a-3sixfold | b-2sixfold | c-1sixfold |
| 10-Hexagonal system contain | | |
| a-7planes | b-6planes | c-5planes |
| 11-Orthorhombic system contain | | |
| a-3planes | b-2planes | c-4planes |
| 12-Orthorhombic system contain | | |
| a-3twofold | b-2twofold | c-4twofold |
| 13-Monoclinic system contain | | |
| a-1planes | b-2planes | c-3planes |
| 14-Monoclinic system contain | | |
| a-1twofold | b-2twofold | c-3twofold |
| 15-Trigonal system contain | | |
| a-5twofold | b-4twofold | c-3twofold |
| 16-Trigonal system contain | | |
| a-(3) | b-(3) | c-(No) |
| 17-Trigonal system contain | | |

a-3planes	b-4planes	c-5planes
18-Triclinic system contain		
a-1planes	b-2planes	c-no planes
19-Miller Index of hemi-B dome in triclinic system		
a-(hl0)	b-(hk0)	c-(h0l)
20-Miller Index of hemi-prism in triclinic system		
a-(011)	b-(100)	c-(110)
21-Miller Index of basal pedion		
a-(100)	b-(010)	c-(001)
22-Miller Index of basal pinacoid in orthorhombic system		
a-(100)	b-(010)	c-(001)
23-Miller Index of side pinacoid in orthorhombic system		
a-(100)	b-(010)	c-(001)
24-Miller Index of front pinacoid in orthorhombic system		
a-(100)	b-(010)	c-(001)
25-Miller Index of A dome in orthorhombic system		
a-(hk0)	b-(h0l)	c-(0kl)
26-Miller Index of B dome in orthorhombic system		
a-(hl0)	b-(hk0)	c-(h0l)
27-Miller Index of prism in orthorhombic system		
a-(011)	b-(100)	c-(110)
28-Miller Index of bipyramidal in orthorhombic system		
a-(110)	b-(hk0)	c-(hkl)
29-Miller Index of first order prism in tetragonal system		
a-(011)	b-(110)	c-(100)
30-Miller Index of second order prism in tetragonal system		
a-(111)	b-(110)	c-(001)
31-Miller Index of ditetragonal prism		
a-(hhl)	b-(h0l)	c-(hk0)
32-Miller Index of first order bipyramidal in tetragonal system		
a-(hhl)	b-(h0l)	c-(hk0)
33-Miller Index of second order bipyramidal in tetragonal system		
a-(hhl)	b-(h0l)	c-(hk0)
34-Miller Index of ditetragonal bipyramidal		
a-(hhl)	b-(hkl)	c-(hk0)
35-Miller Index of basal pinacoid in hexagonal system		
a-(1000)	b-(0101)	c-(0001)
36-Miller Index of first order prism in hexagonal system		
a-(101-0)	b-(0101)	c-(1001)

- 37-Miller Index of second order prism in hexagonal system
a-(112⁻⁰) b-(111⁻⁰) c-(001⁻¹)
- 38-Miller Index of dihexagonal prism
a-(hko⁻⁰) b-(hh0l) c-(hkl⁻⁰)
- 39-Miller Index of first order bipyramidal in hexagonal system
a-(h0h⁻¹) b-(hh0l) c-(hkl0)
- 40-Miller Index of second order bipyramidal in hexagonal system
a-(hh2h⁻¹) b-(hh0⁻¹) c-(hkl⁻⁰)
- 41-Miller Index of basal pinacoid in trigonal system
a-(1000) b-(0101) c-(0001)
- 42-Miller Index of first order prism in trigonal system
a-(101⁻⁰) b-(010⁻¹) c-(1001)
- 43-Miller Index of second order prism in trigonal system
a-(112⁻⁰) b-(111⁻⁰) c-(1100)
- 44-Miller Index of dihexagonal prism in trigonal system
a-(hko⁻⁰) b-(hh0l) c-(hkl0)
- 45-Miller Index of rhombohedron in trigonal system
a-(h0h⁻¹) b-(hh0l) c-(hkl⁻⁰)
- 46-Miller Index of second order bipyramidal in trigonal system
a-(hh2h⁻¹) b-(hh0l) c-(hkl⁻⁰)
- 47-Miller Index of ditrigonal scalenohedron in trigonal system
a-(hh2h⁻¹) b-(hko⁻¹) c-(hkl⁻⁰)
- 48-Miller Index of basal pinacoid in monoclinic system
a-(100) b-(010) c-(001)
- 49-Miller Index of side pinacoid in monoclinic system
a-(100) b-(010) c-(001)
- 50-Miller Index of front pinacoid in monoclinic system
a-(100) b-(010) c-(001)

Good luck

Prof. Dr. Mohamed Abd El-Raouf Hassan

Assiut University Faculty of Science Geology Department		جامعة أسيوط كلية العلوم قسم الجيولوجيا
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Second Semester Final Examination

Geology Students 2nd Level

(Invertebrate Paleontology)

June 2023	G215	50 Degree	Time: 2 hours
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ملحوظة هامة: الامتحان يتكون من أربع صفحات والإجابة في الشيت في الصفحة رقم خمسة

Answer the following questions.

Q1. Put (T) for True statements or (F) for False statements: (30 marks; 1 mark each)

- 1- Foraminiferal hyaline calcareous shell are characterized by the presence of perforations in the test wall.
- 2- Graptolietes are usually preserved by petrification processes.
- 3- Dicyclic calyx in Crinoidea consists only of radial and basal plates.
- 4- The porcelaneous wall type in Foraminifera is characterized by the arrangement of the calcite crystals parallel to the C axis.
- 5- Regular echinoids typically have an infaunal lifestyle.
- 6- Spiders, shrimps are systematically classified as members of phylum Arthropoda.
- 7- Several trilobite genera become extinct in the Late Devonian due to eustatic change.
- 8- Gastropods preferred cool water and usually lived in deep marine environments.
- 9- Benthonic foraminifera is considered an important tool in paleoenvironmental analysis.
- 10- Index fossils that are short-ranging are usually abundant and can be found in geographically widespread areas.
- 11- Calcareous wall marine microorganisms usually lived below the calcium carbonate compensation depth.
- 12- Porifera are characterized by having a primitive nervous system.

- 13- Lycon type wall structure is considered the most advanced type in sponge.
- 14- Members of order calcarea flourished through Mesozoic Era.
- 15- The bivalve shells are characterized by radial symmetry with a plane of symmetry passing between the valves.
- 16- Periostracum is the outer layer in bivalve shell which is composed of organic matter that is commonly preserved in fossil state.
- 17- Members of Hydrozoa have geologic range extending from Cambrian Period to recent.
- 18- All organisms have an unequal chance to be a part of the fossil record.
- 19- Ceroid tetracorals are defined as polygonal corallites which have a clear dividing wall.
- 20- Foraminifera belongs to the kingdom of animalia.
- 21- Gastropod fossil remains have geologic range extending from Paleozoic Era to recent.
- 22- The smaller valve in oysters is usually cemented to the substrate, while the larger one acts as operculum.
- 23- Graptolites are rarely found in the deep-water black shales.
- 24- Foraminifera reach their maximum diversity in the upper Cretaceous Epoch.
- 25- When the hinge line and axis in brachiopod shells are not parallel, it is called strophic hinge line.
- 26- Articulate brachiopods constitute the main part of brachiopod fossil record.
- 27- Members of Echinoid are characterized by pentameral symmetry in their earlier stage of growth.
- 28- In bivalves the plane of symmetry is usually perpendicular to the hinge line.
- 29- In the bivalve didymont dental plate, the Teeth are numerous and arranged along a straight or curved hinge.
- 30- Graptolites are characterized by skeleton made up of silica.

Q2: Choose the correct answer; A, B, C or D (20 marks; 1 mark each)

31- Graptolites can be classified into two groups according to their.....

- A- branches B- geologic range C- skeleton structure D- shape

32-foraminifera can be lived below the calcium carbonate compensation depth

- A- calcareous B- agglutinated C- planktonic D- benthonic

33- The apical system in Echinoidea is made up of..... perforated interconnected plates

- A- five B- ten C- twenty D- thirty

34- Trilobites reached their lowest abundance in the..... Period

- A. Ordovician B. Cambrian C. Permian D. Devonian

35- Ammonoids are classified into three main categories based on the.....of the suture line

- A. serration B. ornamentation C. length D. width

36- Fusulinid foraminifera consider an index fossil for the.....Era

- A. Mesozoic B. Cenozoic C. Paleozoic D. Archean

37-are among spongia that preferred warm water regions.

- A. Tetraxonida B. Cornacuspongia C. Heteractinellida D. Calcareia

38- The following factors could affect the distribution of foraminifera except.....

- A. depth B. light C. Temperature D. alkalinity

39-represent the great fossil record of the oldest living hard shell organisms.

- A. Cephalopods B. Gastropods C. Foraminifera D. Brachiopods

40- Ceratitic cephalopods have a geologic range restricted to..... Period

- A. Permian B. Cretaceous C. Jurassic D. Triassic

41- The only phylum within subkingdom Parazoa known as the.....

- A. Colentrata B. Arthropoda C. Mollusca D. Porifera

42- Foraminifera reach their maximum diversity in.....Age.

- A. Maastrichtian B. Danian C. Ypresian D. Aptian

43- During the..... Period oysters formed thick banks that could extend for several kilometers.

- A. Permian B. Cretaceous C. Jurassic D. Triassic

44- The posterior end of the pedicle valve which is usually penetrated by foramen is termed....

- A. commissure line B. peak C. hinge axis D. lophophore

45- One of the following microorganisms usually having a dimorphism in its lifestyle is.....

- A. calcareous nannoplankton B. foraminifera C. bivalve D. gastropoda

46- The largest group of cnidaria known as.....

- A. Scyphozoa B. Anthozoa C. Hydrozoa D. Obelia

47- The margin of the aperture in gastropods shell known as.....

- A. columella B. peristome C. anal canal D. siphonal canal

48- The resilient horny substance that unites the two valves along the dorsal margin in bivalve shell known as.....

- A. ligament B. beak C. adductor muscles D. pallial line

49- The tracks and trails of the ancient life usually called.....

- A. trace fossils B. mould C. cast D. pseudofossils

50- One of the following conodont elements has a thin bar with multiple not fused denticles along their sides known as.....

- A. bar-type B. simple cone C. blade-type D. platform

بالتوفيق ان شاء الله

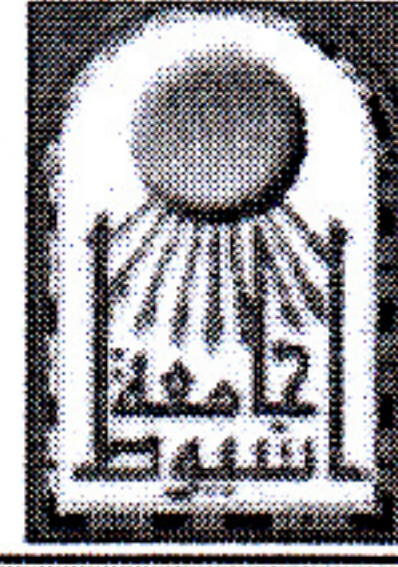
انتهت الأسئلة

Answer sheet

Q1	Answer
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Q 2	Answer
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Assiut University
Faculty of Science
Department of Geology



Date: June 2023
Time allowed: 2 hours

Final Exam
Principles of Geophysics (G250), Total 50 Marks

=====

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

Statement	True (✓)	False (X)
1. Geophysics does not replace traditional geologic study; it compliments it		
2. Electrolytic conduction is faster than electronic conduction and occurs in fluids		
3. Resistivity increases with increasing metallic minerals content		
4. True resistivity is defined as the resistivity of the subsurface when it is inhomogeneous and anisotropic and can be estimated from data inversion		
5. By increasing the electrode spacing, more of the injected current will flow to shallower depths		
6. One of the disadvantages of electrical resistivity method that the electrodes must be in a good contact with soil		
7. Electrical resistivity can be used to map salt-water intrusion		
8. The sign of the self-potential is an important diagnostic factor in the interpretation of SP anomalies		
9. The interpretation of SP is mostly quantitative		
10. Sato and Mooney (1960) have provided the most complete explanation of the electrochemical processes caused the mineral SP anomalies		
11. Self-potential can be used to map the locations of water seepage in dams.		
12. The gravity field is perpendicular to the surface of the earth whereas the magnetic field direction varies.		
13. The gravity acceleration of plutonic igneous rocks is greater than the volcanic rock		
14. The free-air effect is added if you are above sea-level and is subtracted if you are below sea-level		
15. The range of gravitational acceleration at the Earth's surface ranges from approximately 9.78 m/s ² at the poles to 9.83 m/s ² at the Equator		
16. Pendulum and free-falling body methods are used to measure relative gravity		
17. Base station readings are used to determine the temporal variations in gravity and to correct for drift error in readings		

18. The higher the value of the modulus, the stronger the material, and the smaller the strain produced by a given stress		
19. Secondary seismic waves can travel through liquids		
20. The inclination reaches its maximum (90°) at the equator		
21. Geomagnetic field is produced by electric currents induced within the conductive molten outer core as a result of slow convective movements within it		
22. Rocks with small concentration of ferro or ferri-magnetic minerals have the highest magnetic susceptibility values		
23. The range of magnetic field strength at the Earth's surface ranges from approximately 60000 nT at the poles to 30000 nT at the Equator		
24. Magnetic susceptibilities of basic rocks are higher than sedimentary rocks		
25. The gravity method is active whereas the magnetic method is passive		

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 electrical resistivity method is:

- a. Density
- b. Magnetic susceptibility
- c. Elasticity
- d. Electrical resistivity or conductivity

27) 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

28) 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

29) Electrical resistivity method can be used to map:

- a. groundwater
- b. minerals and Ore deposits
- c. paleochannels
- d. all the above

30) Subsurface cavities filled with air will show:

- a. resistive response
- b. conductive response
- c. no response
- d. all the above

31) The self-potential method is classified as:

- a. active method
- b. inactive method
- c. passive method
- d. none the above

32) 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

33) 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

34) Electrokinetic potential may result from the gradient in:

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

35) 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

36) 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

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

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

38) The most factor controlling the density of sedimentary rocks is:

- a. compaction
- b. age
- c. depth of burial
- d. porosity and fluid content

39) The typical station spacing for near surface targets (e.g., archaeology) in gravity survey is:

- a. 1000's of m
- b. few meters
- c. 100's of m
- d. 10's of m

40) 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

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) which of the following properties of earth materials control the propagation velocity of seismic waves:

- a. elastic moduli
- b. resistivity
- c. magnetic susceptibility
- d. none the above

43) 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

44) The following characterize the surface waves:

- a. travel along the outer part of the Earth
- b. have complex motions
- c. causes greatest destruction
- d. all the above

45) The angle of incidence that results in an angle of refraction equals to 90° is called:

- a. absolut angle of refraction
- b. relative angle of refraction
- c. critical angle of refraction
- d. none the above

46) 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

47) Which of the following geophysical methods can be used to map depth to bedrock:

- a. Self-Potential
- b. Seismic refraction
- c. Electrical resistivity
- d. b and c

48) The declination is defined as the deflection of the north seeking pole from:

- a. geographic east
- b. geographic north
- c. geographic west
- d. none the above

49) The magnetic susceptibilities of rocks depend on the:

- a. type of magnetic minerals
- b. concentration of magnetic minerals
- c. a and b
- d. type and concentration of metallic minerals

50) The diurnal changes in magnetic field are:

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

End of questions

Good Luck

Course Instructor: Prof. Dr. Gamal Zidan Abdelaal