Geology Department
Faculty of Science
Assiut University

Time: 2 H
Ju. 2021

Crystallography (233 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-Hexagonal system contains six twofold ( )
27-Hexagonal system contains seven planes ( )
28-Orthorhombic system contains three twofold ( )
29-Orthorhombic system contains three planes ( )
30-Trigonal system contains three planes ( )

2-CHOOSE THE CORRECT ANSWER OF THE FOLLOWING

31-Prism form is: a-open   b-closed

32-First order prism has miller index: a-110   b-100   c-hko

33-Ditetragonal prism has miller index: a-110   b-100   c-hko

34-Bipyramid is: a-open   b-closed   c-compound

35-Ditetragonalbipyramid has: a-12 faces   b-8 faces   c-16 faces

36-Trapezohedron is: a-closed form   b-open form

37-Scalenohedron is: a-closed form   b-open form

38-Rhombohedron form have: a-3 faces   b-6 faces   c-8 faces

39-Mineral crystal in octahedronform is   a-fluorite   b-pyrite

c- galena   d-all of the above

40-Mineral crystal in octahedronform is   a-fluorite   b-perovskite

c-halite   d-all of the above

41-A dome form is: a-open   b-closed

42-Second order prism has miller index: a-110   b-100   c-hko

43-Ditetragonal prism has miller index: a-110   b-100   c-hko

44-Pyramid is: a-open   b-closed   c-compound

45-Ditetragonal bipyramid has: a-12 faces   b-8 faces   c-6 faces

46-First order prism has: a-4 faces   b-8 faces   c-6 faces

47-Miller Index of b dome   a-0kl   b-h0l   c-110

48-Ditetragonal prism has: a-4 faces   b-8 faces   c-6 faces

49-Second order prism has miller index: a-110   b-100   c-hko

50-Ditetragonal prism has: miller index: a-110   b-100   c-hko

Oral Exam.

Complete of the following:

1-Miller Index of prism in monoclinic system   (   )

2-Miller Index of prism in triclinic system   (   )

3-Miller Index of dibipyramidal in tetrigonal   (   )

4-Miller Index of dibipyramidal in hexagonal   (   )

5-Miller Index of bipyramidal in orthorohombic   (   )

6-Miller Index of tetrahexahedronl in cubic   (   )

7-Miller Index of trioctohedronin cubic   (   )

8-Miller Index of hexaoctahedron in cube   (   )

9-Miller Index of basal pinacoid in hexagonal system   (   )

10-Miller Index of basal in trigonal system   (   )

Part I: Final Exam (50 Marks)

A. Choose The correct answer (2.5 Marks/Each)

1. Which of the following set of elements account for > 98 % (weight %) of the earth's crust, in descending order of abundance?

a. Graphite, quartz, Chlorite, Talc.

b. O, Si, Al, Fe, Ca, Na, K, Mg.

c. Si, Na, Ca, K, Fe, Al, O, Mg.

d. O, Si, Fe, Mg, Ca, K, Na, Al.

2. The silicon – oxygen tetrahedron is:

a. The building block of the silicate minerals.

b. Composed of 4 oxygen atoms surrounding 1 silicon atoms.

c. Composed of the two most abundant elements of the Earth.

d. All of these.

3. The most common group of rock – forming minerals is the :

a. Sulfides.   b. Carbonates.   c. Oxides.   d. Silicates.

4. The ratio of Silicon atom to oxygen atom in double chain silicates is:

a. 1 : 3.   b. 2 : 5   c. 1 : 2.   d. 4 : 11.

5. Which one of these minerals exhibit a sheet silicate structure?

a. Olivine.   b. Quartz.   c. Feldspar.   d. Margarite.

6. What is the silicate class having highest Si : O ratio?

a. Nesosilicate.   b. Sorosilicates.   c. Tectosilicates   d. Double chain Silicates.

7. Muscovite and Phlogopite:

a. All are three – dimensional silicates.

b. Muscovite and phlogopite are inosilicates.

c. All are orthosilicates

d. All are layered silicates

8. Electron sea or delocalized electrons exist in:

   a. polar bonds   b. ionic bonds   c. covalent bonds   d. metallic bonds

9. The formula of silicate ion presents in phyllosilicate is:

   a. $(Si_6O_{18})^{12-}$ b. $(Si_4O_{11})^{6-}$ c. $(Si_4O_{10})^{4-}$ d. $(Si_2O_7)^{6-}$.

10. Silicate Structure in which the tetrahedron sharing 2 oxygen atoms is called:

   a. Sheet Silicates   b. Sorosilicates   c. Single chain Silicates

   d. Double chain Silicates

11. The general formula of silicate ion present in cyclosilicates is:

   a. $(SiO_4)^{4-}$ b. $(Si_2O_5)^{2-}$ c. $(Si_2O_7)^{6-}$ d. $(Si_6O_{18})^{12-}$

12. Silicate Structure in which the tetrahedron sharing 4 oxygen atoms is called:

   a. Cyclosilicates   b. Double chain Silicates   c. Sheet Silicates   d. Tectosilicates

13. The pyrophyllite mineral is an example of :

a. TOT structure

b. TOT+C structure (replacement of Al to Si with percentage 1:3)

c. TOT+C structure (replacement of Al to Si with percentage 1:1)

d. TO structure

14. The biotite mineral is an example of:
a. TOT structure

b. TOT+C structure (replacement of Al to Si with percentage 1:3)

c. TOT+C structure (replacement of Al to Si with percentage 1:1)

d. TO structure

15. The chlorite mineral is an example of:

a. TOT structure

b. TOT+C structure (replacement of Al to Si with percentage 1:3)

c. TOT+C structure (replacement of Al to Si with percentage 1:1)

d. TOT+O structure

B. Choose (T) for True statements or (F) for False statements (2.5 Marks/Each)

16. Twelve – fold coordination (C.N. =12) is the largest common coordination number such as Fe^{2+} and Al^{3+}.

     a. True   b. False

17. Sheet silicate minerals are anhydrous minerals

     a. True   b. False

18. The silicate structures are classified into six classes on the bases of degree of polymerization and the number of non-bridging oxygen

     a. True   b. False

19. The kaolinite mineral is an example of TOT structure

     a. True   b. False

20. The least degree of polymerization in silicate structure is presents in framework silicates while the highest degree of polymerization in silicate structure is presents in nesosilicates

     a. True   b. False

C. Choose The correct answer (2.5 Marks/Each)

21. Which of the following statements are correct for double chain silicates?

    a. The empirical formula is $(SiO_3)^{2-}$.
    b. The empirical formula is $(Si_4O_{10})^{4-}$.
    c. There are only one type of tetrahedron.
    d. The empirical formula is $(Si_4O_{11})^{6-}$.

22. The number of anions in Cubic Coordination that can surround and touch the cation is:

    a. 12   b. 6   c. 8   d. 4
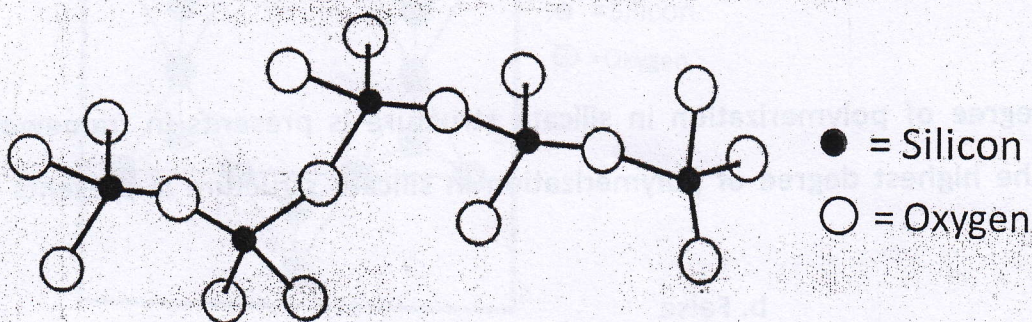
23. The number of anions in tetrahedral Coordination that can surround and touch the cation is:

    a. 12   b. 6   c. 8   d. 4

24. The number of anions in octahedral Coordination that can surround and touch the cation is:

    a. 12   b. 6   c. 8   d. 4

25. The degree of polymerization of the following silicate structure is:

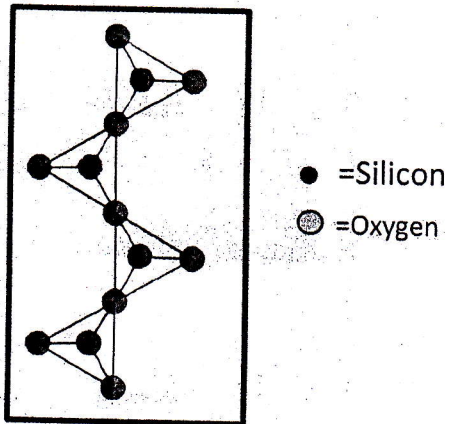● = Silicon
○ = Oxygen

    a. 3   b. 2.6   c. 2.4   d. 2.5

26. The ideal dioctahedral sheet has a formula:

a. $Mg_3(OH)_6$ b. $Mg_4(OH)_6$ c. $Al_3(OH)_6$ d. $Al_2(OH)_6$

27. The ideal formula of trioctahedral sheet is often given as:

a. $Mg_3(OH)_6$ b. $Mg_4(OH)_6$ c. $Al_3(OH)_6$ d. $Al_2(OH)_6$

28. The following silicate structure is:

● =Silicon
◎ =Oxygen
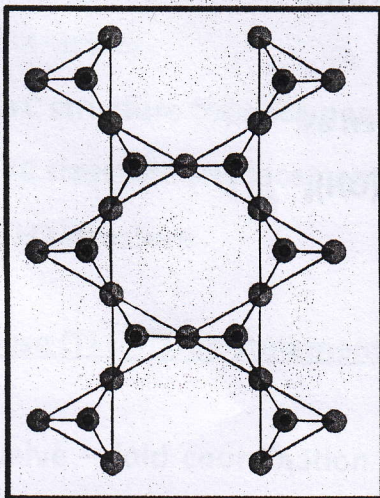
a. Disilicates   b. Orthosilicates   c. Single chain silicates   d. phyllosilicates

29. The following silicate structure is:
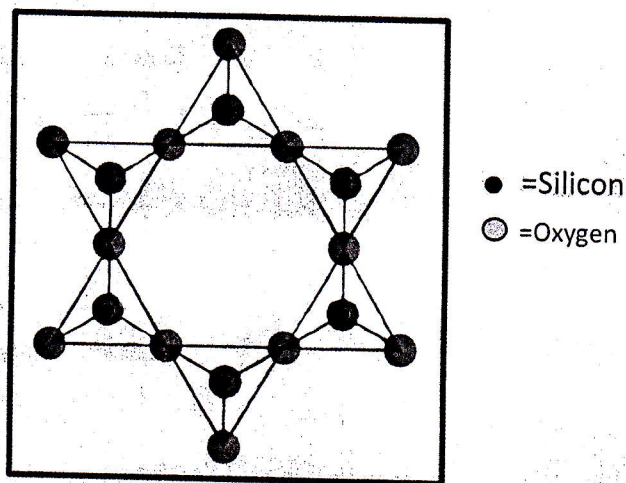
● =Silicon
◎ =Oxygen

a. Double chain silicates   b. cyclosilicates   c. Inosilicates   d. phyllosilicates

30. The following silicate structure is:

● = Silicon

◎ = Oxygen

a. Double chain silicates   b. Single chain silicates   c. Sorosilicates   d. Phyllosilicates
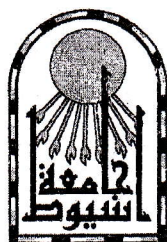
D. Choose (T) for True statements or (F) for False statements (2.5 Marks/Each)

31. The hexagonal closest packing is arranged by stacking atoms every two layers

   a. True   b. False

32. Van Der Waals bonds are quite weak, and minerals that have them, such as quartz and feldspar.

   a. True   b. False

Level two examinations

Course No. (G234)

Part I

A-Mark right (✔) or (✗) wrong: (30 Marks)

1. (   ) Five planes of symmetry are found in tetragonal system
2. (   ) Prism faces cut all crystallographic axes
3. (   ) {21$\bar{3}$1} with 12 faces is hexagonal bipyramid
4. (   ) {101} in orthorhombic is bipyramid
5. (   ) {101} in tetragonal is bipyramid
6. (   ) Bipyramids are always general forms
7. (   ) {100} in orthorhombic is side pinacoid
8. (   ) {111} is a special form
9. (   ) Prism is a closed form
10. (   ) {221} is a general form
11. (   ) {211} is a-dome
12. (   ) Prisms always parallel c-axis
13. (   ) First order denotes axes from edges
14. (   ) {10$\bar{1}$1} is b-dome
15. (   ) The b-dome cuts only the c-axis
16. (   ) {100} in tetragonal is front pinacoid
17. (   ) Orthorhombic prism has 2 faces
18. (   ) {110} is a prism
19. (   ) Bipyramids are always closed forms.
20. (   ) Pinacoids are open forms.
21. (   ) Black cross on white field is uniaxial interference figure
22. (   ) Interference colours are observed in plane polarized light

23.(   ) *Indicatrix is 3D body representing refractive indices*

24.(   ) *Extinction in dimetric crystals is oblique*

25.(   ) *Indicatrix of isometric crystals is a sphere*

26.(   ) *Change of colour is called pleochroism*

27.(   ) *Polarizing microscope has only two polarizing plates*

28.(   ) *Double refraction is a property of all minerals*

29.(   ) *Change of relief is called twinkling*

30.(   ) *Analyzer is an optical property*

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

31. {010} in orthorhombic is ……….. pinacoid.
   a) Side   b) Front   c) Basal

32. {221} is a ……….. form
   a) Special   b) Closed   c) Both

33. Dihexagonal bipyramid consists of …… faces.
   a) 16   b) 22   c) 24

34. Domes are …….. forms
   a) Closed   b) Open   c) General

35. {100} is an index of ……
   a) Tetragonal prism   b) a-pinacoid   c) Both

36. {101} in orthorhombic is …………….
   a) Open form   b) General form   c) Both

37. Bipyramid is …………. form.
   a) Tetragonal   b) Orthorhombic   c) Both

38. {101} is ……… order bipyramid.
   a) First   b) Second   c) Third

39. Which system has 2 equal axes?
   a) Tetragonal   b) Orthorhombic   c) None

40. Dome is …………….. form.
   a) Orthorhombic   b) Tetragonal   c) Both

41. The a–dome is …………. form
   a) Special   b) Open   c) Both

42. Domes are found in …………… systems.
   a) Tetragonal   b) Orthorhombic   c) Both

43. Twinkling is the change of ....
    a) Grain colour   b)Grain boundaries   c)Grain shape
44. Colour is a result of ....
    a)Double refraction   b)Absorption   c)None
45. A sphere is the indicatrix of ....
    a)Dimetric crystals   b)Isometric crystals   c)Trimetric crystals
46. Interference colours are observed in ....
    a) Crossed nicols   b) Plane polarized light   c)Both
47. Relief is affected by ....
    a)RI of grain   b) RI of medium   c) Both
48. Pleochroism is the change of ....
    a)Relief   b)RI   c)Colour
49. Extinction in uniaxial crystals is............
    a)Parallel   b)Symmetrical   c)Both
50. ....is an accessory plate
    a)Analyzer   b)Quartz wedge   c)Polarizer

Part II
Allocated to ORAL Exam (10 Mark)

Mark right (✓) or (×) wrong:

51. (   ) Bipyramids are open forms
52. (   ) Domes are closed forms
53. (   ) General form cuts all axes at equal distances
54. (   ) Dimetric crystals have equal horizontal axes
55. (   ) Third order tetragonal prism has 4 faces
56. (   ) Relief is a function of double refraction
57. (   ) Extinction is observed in plane polarized light
58. (   ) Extinction in uniaxial crystals is oblique
59. (   ) {$21\bar{1}0$} is a possible index.
60. (   ) The b–dome cuts only the a–axis

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

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

Second Semester Final Examination
Geology Students
(Invertebrate Paleontology)

June 2021	G215	80 Marks	Time: 2 hours

Answer the following questions:

PART ONE: FINAL EXAMINIATION (50 MARK)

First Question

Put true (√) or false (x) in the front of the following sentences (20 mark, two marks for each)

1. Cephalopods ammonitic suture line has a geologic range from Jurassic-Cretaceous   ( )
2. Spongia order Cornacuspongia contains Ascon, Sycon, and Lycon types............... ( )
3. Irregular echinoids are characterized by five-fold symmetry........................... ( )
4. Oysters is made up of two equal valves having one muscle scar........................ ( )
5. Anthozoa is marked by the dominance of the polyp form through its life cycle........ ( )
6. Order Heteractinellida could be considers as a Paleozoic index fossil................. ( )
7. The cardinal teeth in bivalve shells are usually lie on the both sides of the umbo..... ( )
8. Colonial Tetracoralla corals are subdivided based on the relationship between the corallites.. ( )
9. Spongia is generally marine animals but in some cases it could be fresh water .... ( )
10. Phylum Archaeocyatha is classified based on the numbers of walls in their Skeleton... ( )

Second Question

Choose the correct answer (30 mark, Two marks for each)

11......... is a physical factor that controlled the distribution of foraminifera in indirect way
    a. Depth   b. Turbidity   c. Light   d. Temperature

12.............;..can be used as indicator of palaeosalinity
    a. Ostracods   b. Graptolites   c. Foraminifera   d. Brachiopods

13. Cephalopods ceratitic suture line has a geologic range restricted to.............Period
    a. Triassic   b. Jurassic   c. Cretaceous   d. Permian

14. .... consider as a potential weakness of the fossil record
    a. Geographic bias   b. Taxonomic bias   c. Temporal bias   d. All of them

15. Brachiopods which do not have teeth and sockets in its valves known as.........
    a. Articulata   b. Inarticulata   c. All of them   d. None of them

16. ....can be used as geo-thermometers indicator
    a. Conodonts   b. Trilobites   c. Cephalopoda   d. Bivalvia

17. ....is a type of organisms belonging to phylum Arthropoda but they have no modern equivalents
    a. Ostracods   b. shrimps   c. Gastropods   d. Trilobites

18. Phylum Echinodermata can be subdivided into two subphylum on the basis of their......
    a. Symmetry   b. Skeleton structure   c. Mode of life   d. Composition

19. Fusulina larger foraminifera characterizes the...............Era
    a. Mesozoic   b. Cenozoic   c. Paleozoic   d. Paleocene

20. The marine microfossils are very important due to their.....................
    a. abundant occurrence   b. wide geographic distribution   c. minute size   d. all of them

21. Ammonititic Cephalopods suture line has a geologic range from.....................Period
    a. Jurassic-Cretaceous   a. Permian-Triassic   a. Triassic-Jurassic   a. Devonian-Permian

22. One of the following microorganisms has an organic skeleton as a chief characteristic....
    a. Ostracods   b. Graptolites   c. Diatoms   d. Brachiopods

23. Simple cone Conodonts has a geologic range from.................Period
    a. Cambrian-Ordovician   a. Permian-Triassic   a. Devonian-Permian   a. Cambrian

24. Tabulate is an important index fossil to.............Era
    a. Paleozoic   a. Mesozoic   a. Cenozoic   a. Recent

25. Cnidaria exoskeleton could be composed of .... matter
    a. Organic   b. Mineralized   c. a , b   d. None of them

PART TWO: MID-TERM+ORAL+ACTIVITY (30 MARK)
Put true (√) or false (x) in the front of the following sentences (20 mark, Two mark for each)

26. Tabulate and Tetracoralla are considered as important Mesozoic index fossils....... ( )
27. The fossil remains of class Hydrozoa are very abundant during the geologic time... ( )
28. The skeleton of Anthozoa is composed of silica or calcium carbonate, and a thin layer of organic matter.. ( )
29. The Echinoidea skeleton is marked by its endoskeleton type...................................... ( )
30. Spongia is found to characterize the warm and cold regions............................ ( )
31. The Cnidaria medusa form has a geologic importance than the polyp form........... ( )
32. Wall structure of Foraminifera is a stable feature and does not affect by environmental fluctuations .... ( )
33. Planktonic Graptolites are widely considered as pseudo-planktonic..................... ( )
34. The Cardinal teeth in bivalve shell defined as those teeth which lie on the both side of the umbo... ( )
35. Dendritic Graptolites have a geologic range extending to Carboniferous Period...... ( )

Choose the correct answer (10 marks, Two marks for each)
36. Ostracods are characterized by its...................mode of life
    a. Benthonic   b. Nekto-benthonic   c. Pelagic   d. All of them

37. ....are composed of calcium phosphatic tooth-like structures
    a. Ostracods   b. Conodonts   c. Gastropods   d. Trilobites

38. Fossils are generally found in...........rocks
    a. Sedimentary   b. Igneous   c. Metamorphic   d. All rocks

39. ....is a process of conversion of organism remains by physical, biological or chemical changes into fossils
    a. Fossilization   b. Transportation   c. Decomposition   d. All of them

40. Foraminifera can be classified according to................
    a. Life habits and habitats   b. Geologic ranges   c. Wall composition   d. All of them

Good Luck...

امتحان التحريرى لطلاب المستوى الثانى بقسم الجيولوجيا (جميع الشعب)

المقرر: علم الطبقات (٢١٠ ج)

Stratigraphy 210G

دور يونيو ـ العام الجامعى ٢٠٢٠-٢٠٢١م

الدرجة الكلية للأمتحان: ٨٠ درجة (درجة واحدة لكل سؤال من رقم ١ حتى رقم ٨٠)   الزمن: ساعتان

ملحوظات هامة: ـ الامتحان يقع فى **خمس** صفحات والاجابة تكون على نموذج الاجابة المنفصل بكل دقة وحرص

ـ يتم تظليل (طمس ـ تسويد) الاجابة المختارة **بالقلم الجاف فقط**

• Section I: Final exam   (50 marks)

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

1- The principle of superposition means that older beds lie at base; younger overlying beds can erode later.

2- The change in the mineral composition, as reflected by varying colors, can be used to infer the principle of superposition.

3- Formation must be widespread and thick enough to be mappable in the field.

4- Boundaries between lithostratigraphic rock units can be either sharp or gradational.

5- The assemblage zone represents a body of strata containing the maximum abundance of a particular taxon.

6- Direct subsurface stratigraphyic analysis includes the geophysical methods.

7- Subsurface rock correlation differs little from correlation seen in outcrops.

8- Formation can be formed during uniformly changing environmental conditions.

9- According to the principle of "uniformitarianism" rock units which are made up of similar lithology are believed to have deposited at the same time span.

10- The flow is the largest formal lithostratigraphic unit, which is a distinctive layer in a volcanic sequence.

11- Type locality is defined as the specific geographic locality where the stratotype of a layered stratigraphic unit is situated.

12- Original horizontality is globally applicable in stratigraphy because all sediments are thought to have deposited horizontally.

13- The thickness of the formations may range from less than a meter to more several hundreds of meters.

14- The Formation is a formal lithostratigraphic unit lower in rank than the Member.

15- Resistance to weathering and erosion is useful criterion in recognizing formations in the field.

16- Placing relative rock ages based on fossils is termed lithostratigraphy.

17- Time-stratigraphic units are bounded by synchronous horizons called isochrones.

18- Periods are subdivided into twofold or threefold based on the major cycles of marine transgression and regression with distinct unconformities surfaces.

19- Lithostratigraphic units are not the fundamental units of geological mapping.

20- A "Stage" consists of a number of eras.

21- The geological time scale consists only of one major eon (eonothem) such as the Phanerozoic.

22- Lithostratigraphic rock units do not conform to law of superposition.

- Correlation of subsurface formations is normally possible using the least types of the logs available.
24- Naming of some of the systems of the geological time scale is based on lithological connotation such as Carboniferous, while others are based on the tribal names (e.g. Ordovician).
25- The principle of inclusions permits correlation between rock sequences having similar ages from different outcrops.
26- The lithologic logs record changing diameter of the borehole.
27- Formations can be distinguished from each other by abrupt changes in lithology.
28- Ocean currents are important in dispersing marine organisms.
29- Biostratigraphic correlation is based primarily on lithology and other physical properties.
30- The primary sedimentary structures can be used to discriminate and recognize rock units.

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

31- Sedimentary environments that started out side-by-side will end up overlapping one another over time due to:

    A- sea transgression/regression   B- denudation C- erosion   D- tectonism

32- Abundant and widespread taxa are often resistant to extinction, therefore they are:

    A- rare   B- long-ranging   C- missing from sediments   D- short-ranging

33- Regressive/transgressive cycles of the sea cannot result from:

    A- continental drift   B- melting of land ice

    C- epeirogenic movements   D- mass extinctions

34- A rock unit of a Cambrian/Ordovician age means that this rock unit has:

    A- only Ordovician age   B- mostly Cambrian age

    C- both Cambrian and Ordovician ages, but undifferentiated   D- Only Cambrian age

35- In the diagram (A) below, this schematic drawing illustrates:

    A- a partial range zone   B- a concurrent range zone

   C- an assemblage zone   D- an abundance zone
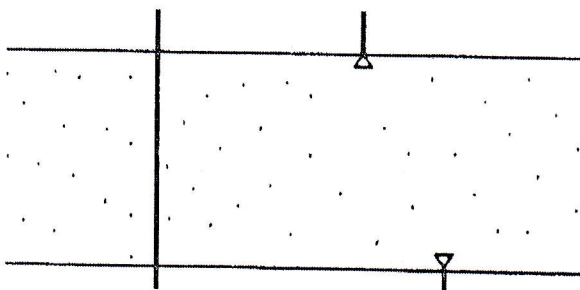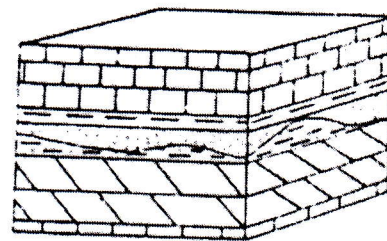
    (A)   (B)

36- In the schematic diagram (B) above, the unconformity seen is of the type:

    A- angular unconformity   B- disconformity

    C- nonconformity   D- paraconformity

37- The principle of cross-cutting relationships states that a dyke is:

    A- younger than the layers it cuts   B- of the same age as the rocks it cuts

    C- older than the layers it cuts   D- none of these answers

- Stratigraphy is the study of:

    A- igneous rocks   B- temporal/spatial distribution of sedimentary rocks

    C- metamorphic rocks of igneous origin   D- plutonic rocks

39- Abundance biozones may move vertically with time due to preservation in:

    A- identical paleoenvironments   B- terrestrial paleoenvironments

    C- varying paleoenvironments   D- marine paleoenvironments

40- For the well-known shale at the Dakhla area, which naming is correct?

    A- Dakhla Formation   B- Dakhla Shale

    C- Dakhla Shale Formation   D- Dakhla Clastics

41- The following conforms to the law of superposition, except of the:

    A- oldest rocks at base   B- rocks deposited in caves

    C- inclusions hosted by older rocks   D- youngest rocks on top

42- Formations cannot be distinguished from each other by their:

    A- rock types   B- microscopic fossil content

    C- abrupt changes in lithology   D- chemical and mineralogical composition

43- Coarser sediments containing marine fossils usually deposit in:

    A- the continental environments   B- far offshore settings

    C- the deeper parts of the shelf   D- the shallower parts of the shelf

44- Subsurface borehole data play ……………... role in stratigraphy:

    A- an important   B- a less important   C- an ignorable   D- a subsidiary

45- Of the information sources that cannot be obtained from drilled boreholes are:

    A- geophysical logs   B- cuttings samples

    C- core samples   D- paleologs of larger vertebrate/invertebrate fossils

46- Which of the following are not considered source of geophysical information that can be obtained from drilled holes?

    A- gamma-ray logs   B- resistivity logs   C- self-potential logs   D- dendritic logs

47- The angular unconformity surface can be:

    A- regular   B- erosive   C- intrusive   D- considered a diastem

48- In the diagram (C) below, ……….. erosion episode(s) can be seen.

    A- one   B- no   C- two   D- more than two
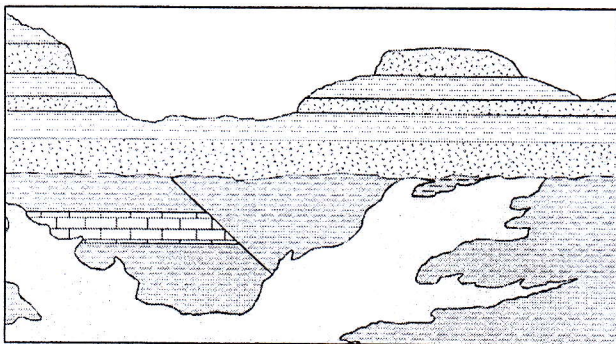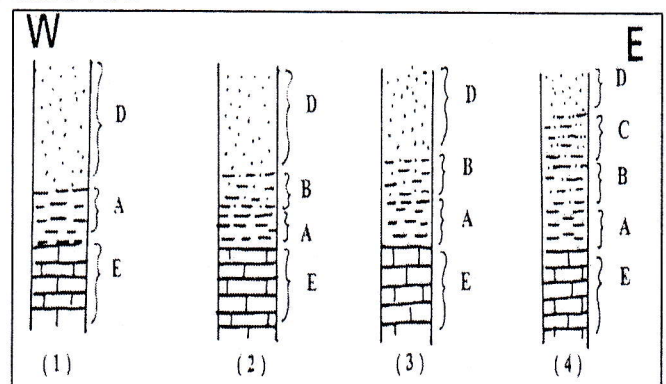
(C)   (D)

49- In the diagram (D) above: Sections 1 to 4 can be interpreted as being resulted from lateral facies change or as representing a hiatus; this practice is termed:

    A- biostratigraphy   B- lithostratigraphy and correlation

    C- chronostratigraphy   D- paleoecology

50- Earth history can be interpreted in terms of processes currently observed today. This
   the known principle of:
   A- superposition   B- original horizontality
   C- uniformitarianism   D- faunal succession

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

Q3: Shade (T) for true statements or (F) for false statements (1 mark each)

51- Formal lithostratigraphic units are those recognized in preliminary studies and
   subsequently fully described.
52- Lateral continuity of rocks can be seen across valley sides.
53- In paraconformities, apparent conformity might be observed across unconformity
   surfaces by the help of fossils.
54- The basic principle of biostratigraphy is that evolutionary changes in faunas and
   floras are reversible.
55- Stratigraphy from outcrops can give a complete picture of the subsurface.
56- Mud cracks are considered one of the cross-cutting agents.
57- Bracketing relationships are used to estimate relative ages of rocks.
58- Time is important in lithostratigraphy, regardless of spatial distribution of rock
   bodies.
59- In lithostratigraphy fossils may work as physical constituents or as rock forming
   elements such as in case of the oyster limestone.
60- Position within a chronostratigraphic unit is expressed by adjectives indicative of
   position such as: basal, lower, middle.
61- In lithostratigraphic correlation, matched united can be diachronous.
62- Comparing sequences measured in different areas is termed correlation.
63- Assemblage zones are rock bodies that are nonfossiliferous.
64- The law of inclusions has an importance in determining the absolute age of rocks.
65- Although more expensive, core samples are better than cuttings samples and offer
   reliable data.
66- The abundance zones are based on the evolutionary changes of taxa.
67- Numerical dating has traditionally formed the most important basis for
   chronostratigraphic classification.
68- In the subsurface work rock units can also be delineated.
69- Global sea level changes can result from local or regional causes.
70- Rate of evolutionary change of species tends to be more rapid in high-stress
   environments such as rocky shores or tidal flats.
71- The concurrent range zone is a body of strata containing the maximum abundance
   of a particular taxon occurring within the stratigraphic range of that taxon, and after
   which the zone is named.
72- An unconformity means that the rock record is continuous regardless of erosion or non-
   deposition.
73- Global mass extinction events, which are observed across stage boundaries, can result
   from local reasons.

74- Correlation of same rock sequences based on lithostratigraphic, chronostratigraphic, geochronologic or biostratigraphic approaches can vary significantly.

75- A chronostratigraphic unit is a body of rocks that includes all rocks formed during a specific interval of geologic time.

76- Sea level fluctuations are all of eustatic nature.

77- In biostratigraphic applications, species that overlap through space and time are less important than others.

78- Availability of good paleogeographic background strengthens the biostratigraphic analysis.

79- Short ranging fossils are often index fossils.

80- In subsurface correlation, if the distances between wells increase the correlation become reasonable.

_____ إنتهت الأسئلة مع أطيب الأمنيات بالتوفيق _____

Examiners:

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

Dr. Amr S. Deaf (Geology Department)

Assiut University
Faculty of Science
Department of Geology

Date: June 2021
Time allowed: 2 hours

Final Exam

Principles of Geophysics (G250), Total 80 Marks

==

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

Statement	True (√)	False (X)
1. Geophysics comes in two basic flavors, 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 3rd 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 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 nucli		
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 that 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 truer resistivity and depths to layer interfaces		
33. One of the advantages of electrical resistivity method 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		

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

51) The physical property of rocks that is most commonly utilized in electrical resistivity method is:
   a. Density
   b. Magnetic susceptibility
   c. Elasticity
   d. Electrical resistively or conductivity

52) Electrical resistivity method can be classified as:
   a. Passive method
   b. Potential method
   c. Active method
   d. All the above

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

54) The electrical conduction occurred by the slightly displacement of electrons to their nucli is called:
  a. electronic conduction
  b. electrolytic conduction
  c. dielectric conduction
  d. atomic conduction

55) 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

56) 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

57) The presence of clay minerals tends to decrease the resistivity because clay minerals:
  a. can combine with water
  b. can absorb cations in an exchangeable state on the surface
  c. tend to ionize and contribute to the supply of free ions
  d. all the above

58) The most common electrode arrays are:
  a. Wenner array
  b. Sato and Money Array
  c. Archie's array
  d. all the above

59) 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

60) Quantitative interpretation of resistivity sounding data can provide information about:
  a. density of electrical resistivity layers
  b. velocity of electrical resistivity layers
  c. depth to electrical resistivity layers
  d. none the above

61) which of the followings are disadvantages of resistivity method:
  a. the electrode must be in a good contact with soil
  b. culture problems causing interference
  c. highly conductive or resistive surface layer
  d. all the above

62) Electrical resistivity method can be used to map:
      a. Groundwater   b. Minerals and Ore deposits
      c. Paleochannels   d. all the above

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

64) Self-potentials are generated by a number of natural sources such as:
      a.   presence of metallic minerals
      b.   fluid streaming
      c.   electrochemical reactions
      d.   all the above

65) The self-potential method is classified as:
      a.   active method
      b.   inactive method
      c.   passive method
      d.   none the above

66) 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

67) 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

68) Electrokinetic potential may result from the gradient in:
      a.   pressure
      b.   temperature
      c.   ion concentration
      d.   none the above

69) Electrochemical potential is also called:
      a.   liquid-junction potential
      b.   Bioelectric potential
      c.   streaming potential
      d.   a and b

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

71) 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

72) SP anomalies are often interpreted qualitatively by:
    a. Profile shape
    b. Amplitude
    c. number of layers
    d. a and b

73) 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

74) 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

75) 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

76) Seismic waves can be classified as:
    a. body waves   b. space waves
    c. surface waves   d. a and c

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

78) 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

79) 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

80) For seismic refraction survey we do not need:
    a. seismograph
    b. electrodes
    c. geophones
    d. seismic sources

End of questions   *Good Luck*

Course Instructor: Prof. Dr. Gamal Zidan Abdelaal

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

Second Semester Final Examination
Zoology Students
(Paleontology)

June 2021	G211	80 Marks	Time: 2 hours

<u>Answer the following questions:</u>

PART ONE: FINAL EXAMINIATION (50 MARK)

First Question

<u>Put true (√) or false (x) in the front of the following sentences (20 marks, Two mark for each)</u>

1. Porifera is considered to be the most primitive of the multi-cellular animals............ ( )
2. The skeletal structure of Sponge is made up of Spongin and/or Spicules................ ( )
3. Archaeocyatha has no spicules in their skeleton structure.................................... ( )
4. Tabulate are most common in carbonate rocks and rarely found in muddy sediments.. ( )
5. Index Fossil should be widely-distributed and has a long geologic range.................. ( )
6. All organisms have an equal chance to be fossilized... ( )
7. The benthonie foraminifera are very important tool for determine the age as well as the paleoenvironment.. ( )
8. Trilobites are first appear during the Early Cambrian period and flourished throughout the Lower Palaeozoic era... ( )
9. Gastropoda has a geologic range extends from Cambrian to Cretaceous................ ( )
10. Brachiopods often have one valve larger than the other................................... ( )

Second Question

<u>Choose the correct answer (30 marks, Two marks for each)</u>

11. Spongia spicules are hard spear or star-shaped structures of .... axon spicules
    a. Monaxon   b. Triaxon   c. Tetraxon   d. All of them

12. ....line is the juncture of the growing margin of the two valves in Brachiopods
    a. Hinge   b. Commissure   c. Pallial   d. Moho

13. All of the following Spongia orders have skeleton made up of silica except.................
    a. Calcarea   b. Cornacuspongia   c. Triaxonida   d. Heteractinellida

14. Tetracoralla are first appeared in.................Period
    a. Devonian   b. Permian   c. Silurian   d. Ordovician

15. Type of fossils that used to determine the age of sedimentary rocks due to their short range geologic age called.....................
    a. Pseudo fossils   b. Index fossils   c. Trace fossils   d. Body fossils

16. Fresh water Spongia is restricted to...............Period.
    a. Jurassic   b. Triassic   c. Carboniferous   d. Cambrian

17. Resilient horny substance which unites the two valves along the dorsal margin known as..
    a. Ligament   b. Beak   c. muscles scars   d. None of them

18. Archaeocyatha has a geologic range restricted to................
    a. Cambrian   b. Cretaceous   c. Jurassic   d. Paleocene

19. The interlocking plates that arranged in 10 double columns radiating out from the top of the upper surface of Echinoidea known as...............
    a. Apical system   b. Corona   c. Madreporite   d. None of them

20. Order...............of Spongia is known as stone sponge.
      a. Calcarea   b. Cornacuspongia   c. Tetracxonida   d. Heteractinellida

21. Processes that take place when water dissolves the original hard parts and replaces them with mineral matter, known as.............
      a. Carbonization   b. Replacement   c. Permineralization   d. Lost of originals

22. Fossilization necessary conditions include..................
      a. Burial speed   b. Nature of sediments   c. Hard structure   d. All of them

23. ....is a Chemical factor that affect the size of foraminifera shell
      a. Salinity   b. Alkalinity   c. Light   d. depth

24. The totality of fossils and their placement in rock formations and sedimentary layers, known as......................
      a. Fossil record   b. Geologic record   c. Biodiversity record   d. All of them

25. Processes that take place when ground water carrying dissolved minerals infiltrates the microscopic pores and cavities in bone and wood, known as.............
      a. Carbonization   b. Replacement   c. Permineralization   d. Lost of originals

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PART TWO: MID-TERM+ORAL+ACTIVITY (30 MARK)
Put true (√) or false (x) in the front of the following sentences (20 mark, Two mark for each)

26. Graptolietes are mostly found in the deep water black shales............................ ( )
27. Brachiopod is classified into two orders according to presence of muscles and teeth.. ( )
28. Spongia classification is depending only on their skeletal structure..................... ( )
29. Tabulate was an important reef formation during the Carboniferous................... ( )
30. Order Calcarea is flourished during the Paleozoic Era.................................... ( )
31. Superorder Ammonoidea has a geologic range extending from Devonian to Cretaceous... ( )
32. All the members of class Echinoidea has a pentameral symmetry........................ ( )
33. Heterodont dental plate in Bivalve shell consists of one cardinal teeth below the umbo as well as elongated lateral teeth... ( )
34. The classification of Anthozoa is based on the number of tabula as well as skeleton type and skeleton structure... ( )
35. Bivalve has a geologic range from Cambrian to Cretaceous, so it considers as an important index fossils... ( )

Choose the correct answer (10 marks, Two marks for each)

36. Trilobites reached their acme during the.............boundary
      a. Cambrian/Ordovician   b. Paleocene/Eocene   c. Permian/Triassic   d. Triassic/Jurassic

37. Numerous teeth are arranged along a straight or curved hinge known as.........dont
      a. Taxodont   b. Schizodont   c. Isodont   d. Cryptodont

38. The essential types of skeletal elements in Tetracoralla include..............
      a. Tabula   b. Septum   c. Dissepiments   d. All of them

39. Foraminifera is belonging to Kingdom...............
      a. Protista   b. Animalia   c. Sarcodina   d. Vertebrate

40. Ostracods carapace elements include.............
      a. Adont hinge   b. Merodont hinge   c. Amphidont hinge   d. All of them

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Good Luck...

Assiut University
Faculty of Science
Department of Geology

جامعة أسيوط
كلية العلوم
قسم الجيولوجيا

Second Semester, Final Examination for 2nd Level Students		
21 June 2021	**On**: GIS (G-240)	Time: 2 hours

Answer the following questions:

First Question: Choose the correct answer: **(50 marks; one mark each)**

1. **All of the following are examples of spatial data except:**
   - a) Latitude and longitude coordinates
   - b) Street address
   - c) Zip code
   - d) Geologic units

2. **GIS stands for:**
   - a) Geographic Information System
   - b) Generic Information System
   - c) Geological Information System
   - d) Geographic Information Sharing

3. **Examples of 'continuous features' are:**
   - a) Air temperature
   - b) Soil salinity
   - c) Elevation
   - d) All of them

4. **GIS uses the information from which of the following sources?**
   - a) Non- spatial information system
   - b) Spatial information system
   - c) Global information system
   - d) All of them

5. **Among the following, which do not come under the components of GIS?**
   - a) Hardware
   - b) Software
   - c) Compiler
   - d) Data

6. **The information in GIS is entered and stored as _____**
   - a) Panels
   - b) Layers
   - c) Single panel
   - d) Dual panel

7. **The user can use GIS to make _____**
   - a) Complex analyses only
   - b) Display maps only
   - c) Complex analyses and display maps
   - d) None of them

8. **City names such as New York, Tokyo, or London refer to _____**
   - a) Nominal locations
   - b) Absolute locations
   - c) Relative locations
   - d) None of them

9. **_____ 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

10. **Among the following, _____ can be expressed as an example of hardware component.**
    - a) Keyboard
    - b) Arc GIS
    - c) Auto CAD
    - d) Digitalization

11. _____ 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

12. _____ are maps of our environment that are stored in our brain, and they are psychological tools that we all use every day.
   a) Thematic maps
   b) Mental maps
   c) Reference maps
   d) Dynamic maps

13. GPS technology consists of a constellation of _____ that are orbiting the earth and constantly transmitting time signals.
   a) 24 satellites
   b) 3 satellites
   c) 4 satellites
   d) 8 satellites

14. _____ refers to defining and describing 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

15. Which of the following statements is true about the capabilities of GIS:
   a) Data capture and preparation
   b) Data management, including storage and maintenance
   c) Data manipulation, analysis, and presentation
   d) All of them

16. _____ is based on the point at which the axis of the earth's rotation intersects the earth's surface.
   a) True north
   b) Magnetic north
   c) Grid north
   d) None of them

17. _____ are simply changeable or interactive representations of the earth.
   a) Thematic maps
   b) Mental maps
   c) Reference maps
   d) Dynamic maps

18. _____ refers to the position of something relative to something else usually along a line.
   a) Location
   b) Distance
   c) Direction
   d) Navigation

19. _____ is measured relative to the equator at zero degrees, with maxima of either ninety degrees north at the North Pole or ninety degrees south at the South Pole.
   a) Longitude
   b) Prime meridian
   c) Latitude
   d) UTM coordinate

20. 60° 35′ 15″ in degrees-minutes-seconds could be expressed as _____ in decimal degrees.
   a) 60.5900
   b) 60.6066
   c) 60.5875
   d) 60.8575

21. 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

22. _____ enables us to understand where landmarks are in relation to each other and to take shortcuts.
    a) Survey knowledge
    b) Route knowledge
    c) Landmark knowledge
    d) None of them

23. 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

24. _____ refer to the methods and procedures that are used to transform the spherical three-dimensional earth into two-dimensional planar surfaces.
    a) Map scales
    b) Map legends
    c) Map projections
    d) Coordinate systems

25. All of 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

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 Mercator projection is an example of a _____ and is famous for distorting Greenland.
    a) Conformal projection
    b) Equidistant projection
    c) Equal-area projection
    d) Equivalent projection

28. Discrete features are well defined and easy to locate, measure, and count, and their edges or boundaries are readily defined. All of the following are examples of such features except:
    a) Buildings
    b) Roads
    c) Traffic signals
    d) Temperature

29. 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

30. UTM coordinate system divides the globe into 60 North/South zones, each _____ wide.
    a) 4° longitudes
    b) 6° longitudes
    c) 8° longitudes
    d) 10° longitudes

31. Each UTM zone divided into _____ , each 8° high lettered from the south pole using C through X letters.
   - a) 20 East/West bands
   - b) 21 East/West bands
   - c) 22 East/West bands
   - d) 23 East/West bands

32. 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.

33. 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.

34. _____ is a set of rules that model the relationships between neighboring points, lines, and polygons and determines how they share geometry.
   - a) Topology
   - b) Projection
   - c) Coordinate system
   - d) Encoding

35. _____ are two-dimensional features created by multiple lines that loop back to create a "closed" feature. They have the properties of area and perimeter.
   - a) Points
   - b) Lines
   - c) Polygons
   - d) None of them

36. _____ occur when the shared boundary of two polygons do not meet exactly.
   - a) Overlaps
   - b) Silvers
   - c) Gaps
   - d) Symmetrical difference

37. 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) Buffers
   - c) Boundaries
   - d) None of them

38. _____ make use of sensors that detect the reflected or emitted electromagnetic radiation from natural sources.
   - a) Geostationary satellites
   - b) Sun-synchronous satellites
   - c) Active satellites
   - d) Passive satellites

39. _____ circle the earth proximal to the equator once each day. They yield high temporal resolution but low spatial resolution.
   - a) Geostationary satellites
   - b) Sun-synchronous satellites
   - c) Polar satellites
   - d) None of them

40. The _____ operation combines adjacent polygon features in a single feature dataset based on a single predetermined attribute.
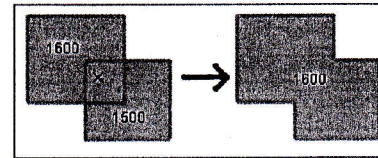   - a) Append
   - b) Dissolve
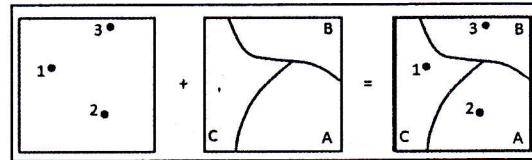   - c) Select
   - d) Merge

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

   a) Append
   b) Dissolve
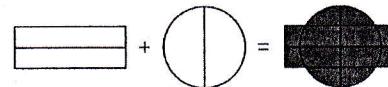   c) Select
   d) Merge

42. The opposite overlay operation represents:

   a) Polygon-on-point overlay
   b) Point-in-polygon overlay
   c) Line-in-polygon overlay
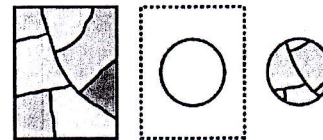   d) Polygon-in-polygon overlay

43. The opposite plot refers to _____ vector operation:

   a) Union
   b) Intersection
   c) Split
   d) Symmetrical difference

44. The opposite plot refers to _____ vector operation:

   a) Erase
   b) Clip
   c) Split
   d) Intersect

45. A source of potential error in an aerial photograph is the _____ , which arises from the three-dimensional aspect of terrain features.

   a) Curvature
   b) Relief displacement
   c) Orthophoto
   d) Error propagation

46. The _____ of a satellite image is the smallest distance between two adjacent features that can be detected in an image.

   a) Spectral resolution
   b) Temporal resolution
   c) Spatial resolution
   d) Radiometric resolution

47. _____ denotes the ability of the sensor to resolve wavelength intervals, also called bands, within the electromagnetic spectrum.

   a) Spectral resolution
   b) Temporal resolution
   c) Spatial resolution
   d) Radiometric resolution

48. A geographic coordinate system depends on _____ as measuring units.

   a) Meters
   b) Feet
   c) Degrees
   d) None of them

49. _____ can be made such that a series of concentric buffer zones are created around the originating feature at user-specified distances.

   a) Multiple ring buffers
   b) Variable-width buffers
   c) Constant-width buffers
   d) None of them

50. 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

Second Question: True or False: (Midterm + Oral + Activity)   **(30 marks; one mark each)**

51. Most common GIS software comes from Environmental Systems Research Institute (ESRI) including ArcMap 9.x and 10.x.   ( )

52. Health records, soil description, and sample quality are examples for attribute data.   ( )

53. "Capture" means getting the real world into the GIS through digitizing.   ( )

54. Filling in the gaps in our mental maps requires us to ask geographic questions about the world where we live and how we relate to it.   ( )

55. In order to determine direction, a reference point or benchmark from which direction will be measured needs to be established.   ( )

56. True north refers to the point on the surface of the earth where the earth's magnetic fields converge.   ( )

57. Examples of some common types of reference maps include topographic maps, aerial photographs, and satellite images.   ( )

58. The representative fraction describes scale as a simple ratio. The numerator denotes map distance and the denominator denotes real-world distance.   ( )

59. The small-scale map shows more detail and less area, while the large-scale map shows more area but less detail.   ( )

60. A spheroid is simply a sphere that is slightly wider than it is tall and approximates more closely the true shape of the earth.   ( )

61. The locations are defined by their respective latitude and longitude within the geographic coordinate system.   ( )

62. Grid north simply refers to the northward direction that the grid lines of latitude and longitude on a map, called a graticule, point to.   ( )

63. 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.   ( )

64. 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.   ( )

65. The JPEG, BMP, and TIFF file formats are based on the raster data model.   ( )

66. Vector data models use points and their associated X, Y coordinate pairs to represent the vertices of spatial features.   ( )

67. Spectral resolution is the amount of time between each image collection period and is determined by the repeat cycle of the satellite's orbit.   ( )

68. Sun-synchronous satellites are those that synchronize a near-polar orbit of the sensor with the sun's illumination.   ( )

69. Orthophotos are vertical photographs that have been geometrically "corrected" to remove the curvature and terrain-induced error from images.   ( )

70. In ArcMap, the "layout view" provides a geographic window in which you can display and work with geographic information as a series of map layers.   (   )

71. The "table of contents" in ArcMap, lists all the layers on the map and shows what the features in each layer represent.   (   )

72. ArcCatalog is used to organize and manage various types of geographic information as logical collections.   (   )

73. The "append" operation creates an output polygon layer by combining the spatial extent of two or more layers.   (   )

74. An overlay is the 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.   (   )

75. In the "intersect" operation, the output layer covers the spatial extent of the overlay and contains features and attributes from both the input and overlay.   (   )

76. The "split" operation is used to divide an input layer into two or more layers based on a split layer.   (   )

77. The "erase" operation preserves only those areas outside the extent of the analogous erase layer.   (   )

78. "Symmetrical difference" operation results in the opposite output as an "intersect" operation.   (   )

79. The line-in-polygon overlay operation employs a polygon input and a polygon overlay.   (   )

80. Variable-width buffers call on a premade buffer field within the attribute table to determine the buffer width for each specific feature in the dataset.   (   )

======= GOOD LUCK =======

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