

(11)

Final Exam  
**Fundamentals of Geology (G100)**

Janu 2015

Time allowed: 2 Hours

Pro Dr. Fawzy Farahat and Prof. Dr. Mahmoud Essa

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**PART ONE: INTERNAL PROCESSES**

A. Fill the spaces with Scientific terms: (each question equal to One degree)

- 1) The thickness of the Earth's mantle is ..... km and most mantle composed of .....
- 2) The Earth's Core is a sphere composed of ..... and ..... alloy having a radius of ..... Km.
- 3) The temperature of magma varies from about .....to.....C.
- 4) Shales make up about.....% of all sedimentary rocks.

B. Put sign ( ✓ ) or sing ( ✕ ) and correct the wrong statement :-

- 5) Rocks that had formed before separation of Pangaea contained identical fossils because the plants and animals had evolved and spread throughout Pangaea.
- 6) The rocks on both sides of Atlantic of Pangaea map, those on the east side of the Atlantic were discontinuous with their counter parts on the west side.
- 7) The inner core is liquid layer, whereas the outer core is solid layer.

C. Choose the correct answer:-

- 8) Andes mountain (South America) formed as result conversion between:
  - a. Convergent of oceanic crust with another oceanic crust.
  - b. Convergent of continent crust with another continental crust.
  - c. Divergent between two oceanic crusts.
  - d. Divergent between two continental crust.
  - e. Convergent of oceanic with continental crust.

(2)

- 9) Where a mineral breaks with curved concavities, the fractured surface is known as:  
a. Uneven                      b. Even                      c. Conchoidal                      d. Hackly
- 10) Which of the following minerals are arranged in order of increasing hardness?  
a. Talc – apatite – corundum – diamond.  
b. Topaz- quartz- fluorite- corundum.  
c. Talc- quartz- calcite- diamond.  
d. Quartz- topaz- diamond- fluorite.  
e. Fluorite- calcite- gypsum- talc.
- 11) Which of the following lists are arranged in order from lowest to highest grade of metamorphism:  
a. Gneiss – slate – schist.  
b. Gneiss – schist – slate.  
c. Slate – schist – gneiss.  
d. Slate – gneiss – schist.
- 12) Which of the following associated with continent – continent convergent plate boundaries?  
a. Volcanic mountain chains                      b. Trenches  
c. Large damaging earthquakes                      d. Subduction
- 13) Choose the correct pair of plutonic rock and its volcanic equivalent:  
a. Gabbro – Trachyte                      b. Peridotite – Andesite  
c. Granodiorite – Basalt                      d. Granite - Rhyolite
- 14) In which of the following crystal systems, the characteristic symmetry elements are: one two – fold axis of rotation and one plane of symmetry?  
a. Tetragonal                      b. Cubic                      c. Hexagonal                      d. Orthorhombic  
e. Monoclinic
- 15) In which of the following crystal systems, the characteristic symmetry elements are: three–two fold axes of rotation and three planes of symmetry?  
a. Tetragonal                      b. Cubic                      c. Hexagonal                      d. Orthorhombic  
e. Monoclinic
- 16) Part of the definition of a mineral?  
a. Man – made.  
b. Definite chemical composition  
c. Unorganized structure.  
d. All of these.



Metamorphic rocks are changed rocks. Which of the following rock types could be the "parent" of a metamorphic rock?

- a. Sedimentary    b. Igneous    c. Metamorphic    d. All of these
- e. None of these.

18) Volcanism is associated with which of the following types of plate boundaries?

- a. Convergent plate boundaries.
- b. Divergent plate boundaries.
- c. Transform fault plate boundaries.
- d. Divergent and convergent plate boundaries.
- e. None of these.

19) Clastic rock is:

- a. A rock formed from the cementation of transported grains.
- b. A rock formed from evaporation by sea water.
- c. Transformed by heat into limestone.
- d. Transformed by pressure into limestone.
- e. None of these.

20) What different between a breccia and conglomerate:

- a. Breccias are coarse – grained and conglomerates are fine – grained.
- b. Conglomerates are coarse – grained and breccias are fine – grained.
- c. Breccias have angular fragments and conglomerates have rounded fragments.
- d. None of these.

21) Approximately how fast does an Earth lithospheric plate move?

- a. Several centimetre per year.
- b. Several centimetre per day.
- c. Several centimetre per hour.
- d. Several centimetre per second.
- e. None of these.

22) When a geologist uses the phrase a heat, pressure and migrating fluids to describe how a type of rock is formed, he or she is probably referring to .....rock.

- a. Sedimentary.                      b. Intrusive igneous.
- c. Metamorphic.                      d. Extrusive igneous.

23) California's San Andreas fault is considered a ..... fault.

- a. Divergent              b. Convergent              c. Transform              d. Reverse

24) The size and arrangement of crystal grains in igneous rocks is called:  
 a. Density      b. Hardness      c. Texture      d. Luster

25) Which of the following types of rock is produced by magma that cools deep in the earth's crust?

- |                         |                         |
|-------------------------|-------------------------|
| a. Extrusive igneous    | b. Intrusive igneous    |
| c. Chemical sedimentary | d. Foliated metamorphic |
- 
-



**B. PART - II ( One Hour)**

F .Dr. Moustafa M .Youssef

Prof. Dr. Ahmed Reda El Younsy

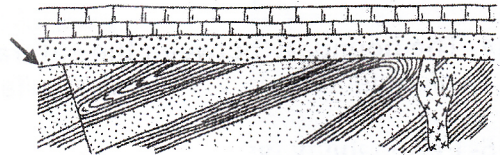
Prof .Dr. Mahmoud A. Essa

**CHOOSE THE CORRECT ANSWER FOR THE FOLLOWING QUESTIONS (25 Marks)****1. In deserts, wind erodes by:.....**

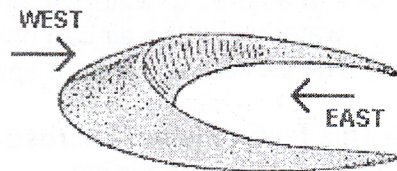
- a. Solution and hydrolysis
- b. Traction and plucking
- c. Solution and traction
- d. Deflation and abrasion

**2- The surface that separates older series from younger sedimentary rocks in this figure is called .....**

- a. angular unconformity
- b. disconformity
- c. nonconformity

**3- Which arrow on the diagram is the correct wind direction to form Barchan sand dunes?**

- a. East
- b. West

**4- When a river meets an ocean or sea which depositional feature is often formed?**

- a. Alluvial fan
- b. Delta
- c. Sand bar

**5. The percent of void space in a sandstone bed is known as.....**

- a. Cement
- b) Porosity
- c) Permeability

**6. . Geographically wide-spread fossil in short span of time is used as ....**

- a.Trace fossil
- b. Index fossils
- c. Body fossil

**7- The surface that divides a fold into two symmetrical halves is called the.....**

- a -Axial plane
- b -Fold axis
- c -Fault
- d -Limb

**8-Weathering is classified into which of the following categories?**

- a. Chemical and mechanical
- b.Physical and mechanical
- c.Organic and inorganic
- d. Clastic and nonclastic
- e. Mechanistic and compositional

**9-Carbonic acid is particularly effective in the solution weathering of .....**

- a. Limestone
- b. Sandstone
- c. Granite
- d. Rhyolite
- e. Shale

**10. A \_\_\_\_\_ is caused by wind erosion, whereas \_\_\_\_\_ is an example of wind deposition.**

- a. Bajadas
- b. Loess
- c. Dunes
- d. Deflation
- e. Desert pavement
- f. Ventifacts

(6)

- 11- oxbow lake .....  
a. is created by the cutoff of a meander      b. is formed by stream aggradation  
c. is formed by flooding      d. none of the above

12- How does weathering differ from erosion?

- a. **Weathering** occurs slowly over time; **erosion** occurs rapidly.
- b. **Weathering** requires the presence of moisture; **erosion** requires moving water.
- c. **Weathering** is an external process; **erosion** is an internal one.
- d. **Weathering** is the breakdown of material in place; **erosion** is the removal of the weathered material.

13- The removal of loose particles from the ground by the wind is called...

- a. Abrasion      b. corrosion      c. ablation      d. deflation

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

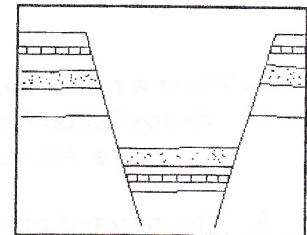
- a- Water table      b- Aquifer      c- Aquiclude      d- Porosity

15- Permeability is:

- a- The ability of a solid to allow fluids to pass through
- b- The process by which plants release water vapor to the atmosphere
- c- The amount of water vapor in the air relative to the maximum amount of water vapor the air can hold
- d- The percentage of pore space in the rock

16- This feature (seen in cross-section) is:

- a. an anticline      b. a graben
- c. a monocline      d. a syncline



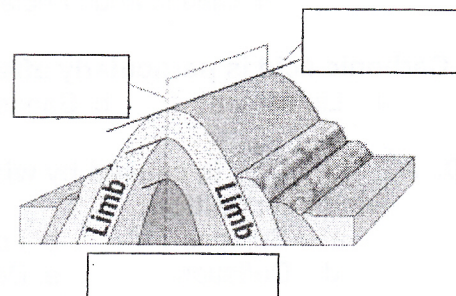
17- Normal graded bedding is characterized by:

- a. an increase in sediment size from bottom to top
- b. a decrease in sediment size from bottom to top
- c. an unsorted mixture of many different sediment sizes

18- Barchans are:

- a. crescent-shaped dunes
- b. ridges parallel to the wind direction
- c. ridges transverse to the wind direction
- d. streamlined bedrock hills scoured by the wind

19- Insert the names in boxes and identify the type of the following Structure





(7)

20-A mechanical weathering process caused by pressure release or unloading

It is.....

- a. ice wedging      b. hydrolysis      c. exfoliation      d. abrasion

21 A syncline:

- a. has beds dipping away from its axis      b. has beds dipping towards its axis  
c. has limbs which converge towards the earth's surface  
d. has older rocks exposed along its axis      e. none of these

22. Most folding results from:

- a. fracturing      b) convection      c) compaction  
d) compression      e) rifting

23. The feature shown in the opposite figure is known as.....



24. Which of the following represents a process of chemical weathering?

- a. Thermal expansion and contraction      b. Mass exfoliation  
c. Hydration and Hydrolysis      d. Frost action and crystal growth

25. The oldest Era of the Phanerozoic Eon is.....

- a. The Mesozoic      b. The Paleozoic      c. The Cenozoic

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GOOD LUCK !

Final Exam  
**Fundamentals of Geology (PG100)**

January 2015

Time allowed: 2 Hours

Prof. Dr. Fawzy Farahat and Prof. Dr. Mostafa Yousef

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**PART ONE: INTERNAL PROCESSES**

**A. Fill the spaces with Scientific terms: (each question equal to One degree)**

- 1) On the map of Alfred Wegener, all the continents were jointed together forming our supercontinent which he called ....., whereas its northern part is commonly called ..... and its southern part .....
- 2) Mesosaurs fossils have been found in ..... and ....., but nowhere else in the world.
- 3) plant fossils (Glossopteris) were found in ....., ....., ..... and .....
- 4) Earth's layers defined by composition is classified into ....., .....and.....whereas Earth's layers defined by physical properties are classified into-----  
-----
- 5) The thickness of continental crust is ranging from ..... to ..... km which under major mountains its thickness increases as much as ..... km.

**B. Put sign ( ✓ ) or sign ( ✗ ) and correct the wrong statement :-**

- 6) The lithosphere is broken into seven large plates. These plates glide slowly over the weak, plastic asthenosphere at rates ranging from 1 to about 18 meter per year.
- 7) The interior portion of lithospheric plates are usually tectonically active.
- 8) Mantle convection is thought to be closely related to movement of lithospheric plates.



12

**C. Choose the correct answer:**

9) Andes mountain (South America) formed as result conversion between:

- a. Convergent of oceanic crust with another oceanic crust.
- b. Convergent of continent crust with another continental crust.
- c. Divergent between two oceanic crusts.
- d. Divergent between two continental crust.
- e. Convergent of oceanic with continental crust.

10) Minerals are:

- a. Inorganic Substances.
- b. Having definite chemical composition.
- c. Having fixed atomic structures.
- d. All statements are correct.

11) Which of the following minerals are arranged in order of increasing hardness?

- a. Talc – apatite – corundum – diamond.
- b. Topaz- quartz- fluorite- corundum.
- c. Talc- quartz- calcite- diamond.
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14) Choose the correct pair of plutonic rock and its volcanic equivalent:

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- b. Conglomerates are coarse – grained and breccias are fine – grained.
- c. Breccias have angular fragments and conglomerates have rounded fragments.
- d. None of these.

20) The two most common elements in Earth's crust are:

- a. Oxygen and Silicon.
- b. Oxygen and Iron.
- c. Aluminum and Silicon.
- d. Aluminum and Iron.

21) When a geologist uses the phrase a heat, pressure and migrating fluids to describe how a type of rock is formed, he or she is probably referring to .....rock.

- a. Sedimentary.                      b. Intrusive igneous.
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(4)  
22) California's San Andreas fault is considered a ..... fault.

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-

**B. PART - II (One Hour)**  
**External Processes**

**CHOOSE THE CORRECT ANSWER FOR THE FOLLOWING QUESTIONS (25 Marks)**

**1. An Anticline:**

- a. has beds dipping away from its axis      b. has beds dipping towards its axis  
 c. has limbs which converge towards the earth's surface  
 d. has older rocks exposed along its axis      e. none of these

**2- When a river meets an ocean or sea which depositional feature is often formed?**

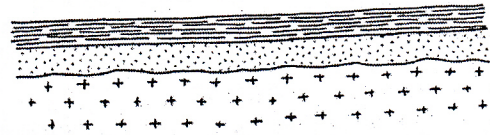
- a. Alluvial fan      b. Delta      c. Sand bar

**3. In deserts, wind erodes by:.....**

- a. Solution and hydrolysis      b. Traction and plucking  
 c. Solution and traction      d. Deflation and abrasion

**4- The surface that separates older igneous rocks from younger sedimentary rocks in this figure is called .....**

- a. angular unconformity  
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 c. nonconformity



**5-Weathering is classified into which of the following categories?**

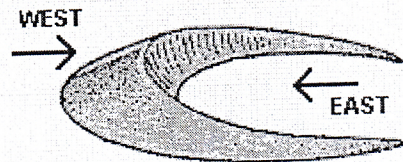
- a. Chemical and mechanical      b. Physical and mechanical      c. Organic and inorganic  
 d. Clastic and nonclastic      e. Mechanistic and compositional

**6- Normal graded bedding is characterized by:**

- a. an increase in sediment size from bottom to top  
 b. a decrease in sediment size from bottom to top  
 c. an unsorted mixture of many different sediment sizes

**7- Which arrow on the diagram is the correct wind direction to form Barchan sand dunes?**

- a. East  
 b. West



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

- a- Water table      b- Aquifer      c- Aquiclude      d- Porosity



163  
9 . Geographically wide-spread fossil in short span of time is used as ....

- a. Trace fossil      b. Index fossils      c. Body fossil

10- The surface that divides a fold into two symmetrical halves is called the.....

- a -Axial plane      b -Fold axis      c -Fault      d -Limb

11- An oxbow lake .....

- a. is created by the cutoff of a meander      b. is formed by stream aggradation  
c. is formed by flooding      d. none of the above

12 -How does weathering differ from erosion?

- a. **Weathering** occurs slowly over time; **erosion** occurs rapidly.  
b. **Weathering** requires the presence of moisture; **erosion** requires moving water.  
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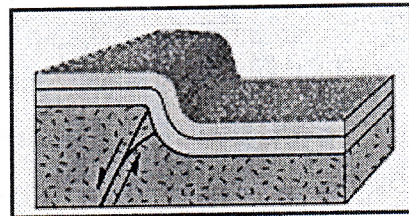
- a. Abrasion      b. corrosion      c. ablation      d. deflation

14. The percent of void space in a sandstone bed is known as.....

- a. Cement      b) Porosity      c) Permeability

15- This feature (seen in cross-section) is:

- a. an anticline      b. a graben  
c. a monocline      d. a syncline



16-Carbonic acid is particularly effective in the solution weathering of .....

- a. Limestone      b. Sandstone      c. Granite      d. Rhyolite      e. Shale

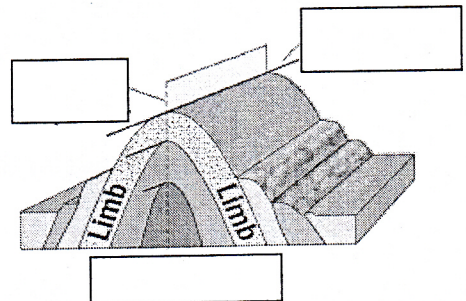
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18- Barchans are:

- a. crescent-shaped dunes  
b. ridges parallel to the wind direction  
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d. streamlined bedrock hills scoured by the wind

19-Insert the names in boxes and identify the type of the following Structure



(7)

**20-A mechanical weathering process caused by pressure release or unloading**

Is .....

a. ice wedging

b. hydrolysis

c. exfoliation

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**21- Permeability is:**

a- The ability of a solid to allow fluids to pass through

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**22. Most folding results from:**

a. fracturing

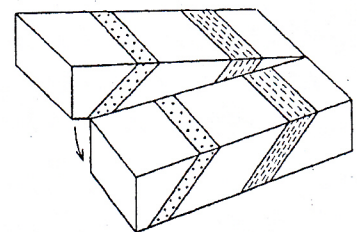
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**Prof.Dr. Moustafa M .Youssef**  
**GOOD LUCK !**



(1)

**B. PART - II ( One Hour)**

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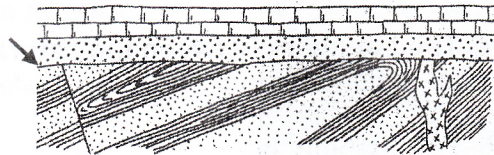
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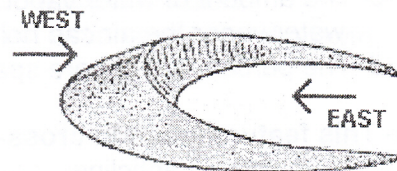
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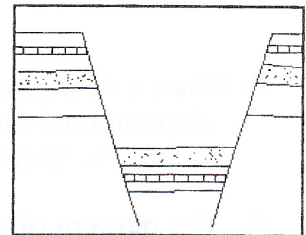
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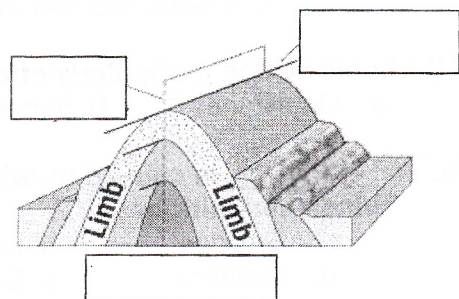
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d) compression      e) rifting

23. The feature shown in the opposite figure is known as.....



24. Which of the following represents a process of chemical weathering?

- a. Thermal expansion and contraction      b. Mass exfoliation  
c. Hydration and Hydrolysis      d. Frost action and crystal growth

25. The oldest Era of the Phanerozoic Eon is.....

- a. The Mesozoic      b. The Paleozoic      c. The Cenozoic

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GOOD LUCK !



First Level Examination in Fundamentals of Geology (G100)

Time: One Hours

PART I (Total Marks 25)

Jan., 2015

Prof. Dr. Mohamed A. Raouf

Answer the following questions: (Each One Mark)

Choose the correct answer of the following:

I-Plate tectonics

1-The earth's crustal plates move

a-A few meters per year

b-a few millimeters per 1000 years

c-a few centimeters per year

d- a few millimeters a day

2-The composition of continental crust:

a-is granitic composition

b-is basaltic composition

3-Average thickness of oceanic crust is

a-5 km

b-7 km

c-35 km

d-100 km

4-Average density of core is

a- 11 g/cm<sup>3</sup>

b- 10 g/cm<sup>3</sup>

c- 9 g/cm<sup>3</sup>

5-The Earth is approximately how old?

a-10 billion years

b-13.7 billion years

c-4.6 billion years

d-2 billion years

6- What type of plate boundary has the two plates moving away from each other?

a-Divergent plate boundaries

b-Convergent plate boundaries

c-Transform-fault plate boundaries

d- All of the above

7-Wegener's evidence of continental drift:

a- Matching of animal and plant fossils

b-fit of continental coastlines

c- Identical rock types of same age

d- All of the above.

8-The man who is credited with developing the continental drift hypothesis is?

a-Wilson

b-Wegener

c-Hess

II-Crystallography and mineralogy

Indicate by the sign ( ✓ ) or ( × ):-

9- The Hexagonal system ( $a = b = c$ ) ( $\alpha = \beta = \gamma = 90^\circ$ )

( )

10- The Triclinic System ( $a \neq b \neq c$ ) ( $\alpha \neq \beta \neq \gamma = 90^\circ$ )

( )

11- The Cubic System ( $a = b = c$ ) ( $\alpha = \beta = \gamma = 90^\circ$ )

( )

12- Minerals can be in a gas or liquid state

( )

13- Sugars is minerals

( )

14- On Mohs hardness scale, calcite has 3

( )



**III-Rocks****15-F** usive rocks are formed from:

a-Magma cooling inside the earth    b-Lava cooling outside on the earth's surface.

**16-** The major difference between intrusive and extrusive igneous rocks is grain size?

a-True

b- False

**17-**The mineral composition of gabbro is plagioclase and pyroxene ?

a-True

b-False

**18-**Clastic sedimentary rocks such as conglomerates, sandstones and shales are classified based on:

a- color

b- density

c- grain size

d- all of the above

**19-**The major difference between breccia and conglomerate is:

a- size of grain

b- composition of grain

c- rounding of the grain

**20-**Which is a chemical sedimentary rock?

a- sandstone

b- conglomerate

c- shale

d- gypsum

**21-** Which is a foliated metamorphic rock ?

a- hornfels

b- marble

c- quartzite

d- slate

**22-**Shale is changed during metamorphism into:

a-slate

b- quartzite

c- marble

d- all of the above

**Write short notes on:****23-**Texture of volcanic rocks**24-**What different between sediments and sedimentary rocks**25-**Agent of metamorphism