
	Assiut University- Faculty of Science Frist Semester- Final Exam 2025-2026 Geology Department	Program: - Level : (1) Date: 2/1/2026 Time: 2 h	
Course Title: Fundamental Geology		Code: 100 G	
Instructors: Prof. Dr. Mohamed Abdel Raouf; Prof. Dr. Mamdouh Soliman; Dr. Hassan Abbas Dr. Fatma Mohamed; Dr. Eman Saad			
Important:	No. of pages 2	No. Of questions 38	Total Mark: 50 degree

1) Choose the correct answer (30 marks; 1 mark for each point):

1. Which of the following statements accurately describes the lithosphere?

- A. It is a hot, plastic layer that flows slowly.
- B. It consists solely of the crust and excludes the mantle.
- C. It is a rigid shell averaging about 100 km thick, consisting of the crust and uppermost mantle.
- D. It is the liquid metallic layer responsible for the magnetic field.

2. According to the Benioff zone concept, where do the deepest earthquakes (up to 700 km) occur?

- A. Along transform faults
- B. At divergent spreading centers.
- C. Within the interior of stable continental plates.
- D. In subduction zones.

3. The "supercontinent" that existed roughly 225 million years ago, comprising all current landmasses, was named:

- A. Gondwanaland
- B. Laurasia
- C. Pangaea
- D. Eurasia

4. Which crystal system has three axes of unequal length intersecting at oblique angles (none are 90°)?

- A. Monoclinic
- B. Orthorhombic
- C. Triclinic
- D. Hexagonal

5. Which crystal system is characterized by four axes (three horizontal axes at 120° and one vertical)?

- A. Isometric
- B. Orthorhombic
- C. Hexagonal/Trigonal
- D. Monoclinic

6. On Mohs Hardness Scale, which mineral represents a hardness of 7?

- A. Calcite
- B. Quartz
- C. Diamond
- D. Talc

7. Which group of minerals is identified by the "Acid Test," where the mineral effervesces (bubbles) when dilute acid is applied?

- A. Silicates (Quartz)
- B. Oxides (Hematite)
- C. Carbonates (Calcite)
- D. Sulfides

8. Which mineral has "perfect cleavage" in one direction, allowing it to split into thin sheets?

- A. Quartz
- B. Mica (Muscovite)
- C. Pyrite
- D. Garnet

9. An igneous rock with a "porphyritic" texture is characterized by:

- A. Being composed entirely of glass with no crystals.
- B. Containing large crystals embedded in a fine-grained matrix.
- C. Having voids and cavities formed by gas bubbles.
- D. Being composed only of very coarse grains (>10mm)

10. Which igneous rock is classified as "Ultrabasic" (Ultramafic) and is composed mostly of olivine?

- A. Granite
- B. Andesite
- C. Peridotite
- D. Basalt

11. Obsidian is formed when:

- A. Magma solidifies deep in the crust over millions of years.
- B. Volcanic magma solidifies instantly/rapidly, preventing crystal formation.
- C. Ash and rock fragments are cemented together.
- D. Lava flows slowly, aligning the crystals.

12. In the formation of evaporites from brine, which mineral precipitates first?

- A. Sodium Chloride
- B. Magnesium salts
- C. Calcium Carbonate
- D. Gypsum

13. Which of the following represents the correct sequence of foliation increasing with metamorphic grade (from low to high)?

- A. Gneiss → Slate → Schist
- B. Slate → Phyllite → Schist → Gneiss
- C. Schist → Phyllite → Slate
- D. Marble → Quartzite → Hornfels

14. Which metamorphic texture is characterized by alternating bands of light and dark minerals?

- A. Slaty cleavage
- B. Schistosity
- C. Gneissosity
- D. Non-foliated

15. Marble is the metamorphic product of which parent rock?

16. What is the main characteristic of a primary structure?

- A) Formed after lithification
B) Formed due to tectonic forces
C) Formed during rock formation
D) Caused by metamorphism

17. Columnar jointing is formed due to:

- A) Tectonic compression
B) Differential weathering
C) Contraction during cooling of lava
D) Folding during metamorphism

18. Which statement about primary and secondary structures is correct?

- A) Both form during deposition
B) Secondary structures destroy all primary structures
C) Primary structures record depositional conditions, secondary record deformation
D) Both are unrelated to geologic history

19. A fold where the limbs dip away from the center is known as a:

- A) Syncline
B) Anticline
C) Monocline
D) Recumbent fold

20. Which product results from chemical weathering of feldspar?

- A) Quartz
B) Calcite
C) Clay minerals
D) Hematite

21. Biological weathering by lichens is mainly:

- A) Mechanical
B) Chemical
C) Thermal
D) Aeolian

22. Frost wedging is an example of.....weathering:

- A) Chemical
B) Biological
C) Mechanical
D) Oxidation

23. Which factor has the greatest control on weathering rate?

- A) Rock color
B) Rock age
C) Climate
D) Rock density

24. Desert pavement forms due to:

- A) Chemical cementation
B) Deflation removing fines
C) Volcanic activity
D) Flash floods

25. Permeability primarily depends on:

- A) Porosity only
B) Grain size and connectivity
C) Rock color
D) Mineral hardness

26. Cone of depression forms around:

- A) Springs
B) Recharge zones
C) Pumped wells
D) Artesian basins

27. Alluvial fans commonly form where:

- A) Rivers enter oceans
B) Streams exit mountains
C) Glaciers melt
D) Wind velocity decreases

28. Oxbow lakes form by:

- A) Stream piracy
B) Flooding
C) Meander cutoff
D) Delta growth

29. Ultimate base level of erosion of a stream is:

- A) River mouth
B) Lake
C) Sea level
D) Groundwater

30. The Phanerozoic Eon includes:

- A) Precambrian
B) Paleozoic, Mesozoic, Cenozoic
C) Archean only
D) Proterozoic only

II) Answer the following questions (20 Marks)

1) Define the following items (6 marks; 1.5 marks for each point):

- Streak
- Center of symmetry in a crystal
- Transform Fault
- Migmatite

2) Based on the classification by silica content, what is the name and typical silica (SiO₂) content range of an intermediate igneous rock? (2 Marks)

3) Compare the oceanic crust and continental crust in terms of average thickness, and dominant composition. (2 Marks)

4) Name only one geologic feature created by: a) Wind erosion, b) Young stream erosion, c) Groundwater deposition and d) Compressional deformation. (2 Marks)

5) Define the following: - An aquifer - Body fossils (2 Marks)

6) Compare between physical weathering and chemical weathering. (2 Marks)

7) Describe the different types of faults. (2 Marks)

8) What are the relative dating principles? (2 Marks)

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