American University of Beirut
Geology Department
Geology 201
Final Exam

August 21, 1999

Student Name:_____

POLICY ON THE EXAM

1. Leave all your **belongings** (except for pens) far from your place.
2. Be silent, **don't look** to the sides.
3. **Read** the questions **carefully** before answering.
4. Anyone found cheating will have his paper confiscated.
5. Make your answers clear (**confused answers will not be considered**).
6. **There is no penalty** in the first three parts, and concerning parts IV answer **only two questions.**

THANK YOU FOR YOUR COOPERATION

Part I. Choose the best answer (50 pts.)

1. Granite is an intrusive igneous rock composed mainly of:

a. feldspar, quartz and mica
b. quartz, olivine and pyroxene
c. feldspar, pyroxene and amphibole
d. quartz, mica and pyroxene

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2. . . . are large irregular (in shape) intrusive igneous bodies that formed at depth in Earth's crust.

a. Dikes
b. Veins
c. Sills
d. Batholiths

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3. . . . and humid climate enhances . . . weathering.

a. Cold . . . chemical
b. Warm . . . chemical
c. Cold . . . physical
d. Warm . . . physical

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4. . . . – horizon is the zone of accumulation where organic matter is sparse.

a. A
b. B
c. C
d. D

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5. Deltaic sedimentary environment belongs to . . . environments.

a. continental
b. shoreline
c. Marine
d. continental margin

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6. Gypsum and . . . precipitate in evaporitic environment after calcite and . . .

a. halite . . . other chlorides
b. dolomite . . . chlorides
c. halite . . . dolomite
d. dolomite . . . halite

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7. . . . is a surface separating two sets of layers with . . . bedding planes.

a. Nonconformity . . . parallel
b. Angular unconformity . . . parallel
b. Nonconformity . . . nonparallel
d. Angular unconformity . . . non parallel

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8. Cenozoic is the . . . era of the . . . eon.

a. first . . . Phanerozoic
b. last . . . Phanerozoic
c. first . . . Proterozoic
d. last . . . Proterozoic

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9. Angle of repose is the . . . angle at which a slope of . . . material will lie without cascading down.

a. maximum . . . consolidated
b. minimum . . . consolidated
c. maximum . . . loose
d. minimum . . . loose

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10. Solifluction is a . . . type of mass movements that occur in . . . regions.

a. slow . . . warm
b. rapid . . . warm
c. slow . . . cold
d. rapid . . . cold

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11. Droughts are periods of months to years when . . . is much lower than normal.

a. precipitation
b. evaporation
c. infiltration
d. evapo-transpiration

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12. Recharge is the . . . of water . . . the subsurface.

a. sublimation . . . into
b. infiltration . . . into
c. sublimation . . . from
d. infiltration . . . from

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13. Saltation is the way by which the . . . load is transported.

a. suspended
b. dissolved
c. bed
d. all of the above
e. none of the above

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14. The stream discharge is the . . . of a stream's flow or the . . . of water that passes at a given point in a given time.

a. length . . . quality
b. size . . . quality
c. length . . . volume
d. size . . . volume

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15. . . . are streamlined parallel ridges aligned with the direction of a strong prevailing . . .

a. Yardangs . . . wind
b. Ventifacts . . . wind
c. Yardangs . . . water flow
d. Ventifacts . . . water flow

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16. Dunes may stabilize and become . . . when the climate becomes . . .

a. lithified . . . more humid
b. vegetated . . . more humid
c. lithified . . . colder
d. vegetated . . . colder

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17. . . . is the zone where the earthquake is originated whereas . . . is the distance of sudden displacement along the fault plane.

a. Epicenter . . . dip
b. Focus . . . dip
c. Epicenter . . . slip
d. focus . . . slip

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18. . . . waves are always faster than . . . waves.

a. P . . . compressional
b. S . . . compressional
c. P . . . shear
d. S . . . shear

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19. . . . scale gives a measure of the intensity (extent of damage) of earthquakes.

a. Richter
b. Mercalli
c. Moment-magnitude
d. Gotenberg

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20. Shallow–focus earthquakes at Transform plate boundaries characterize . . . faulting caused by . . . forces.

a. strike-slip . . . shear
b. normal . . . shear
c. strike-slip . . . compressive
d. normal . . . compressive

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21. Deep focus earthquakes occur along inclined plane of subducted plates at . . . plate boundaries.

a. divergent
b. transform
c. conservative
d. convergent

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22. The Mohorovicic (Moho) discontinuity is the boundary between the . . . and the mantle.

a. lithosphere
b. asthenosphere
c. crust
d. core

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23. . . . waves are compressional waves that travel through the mantle, outer core, and back to mantle.

a. PP
b. PcP
c. S
d. PkP

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24. The highest rate of plate motion is in:

a. Mid Atlantic
b. East Pacific
c. Mediterranean sea
d. Red Sea

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25. At present the best example of continental plate separation is the:
a. East African rift
b. Red Sea
c. Mediterranean
d. Gulf of Aden

Part II. Fill in the blanks (16 pts.)

1. The main two types of igneous rocks are: _____ and _____ igneous rocks.

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2. Lithification which converts sediment into sedimentary rock involves chemical alteration or _____ and physical alteration or _____.

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3. Factors that make masses to move are :_____, _____ _____, and the steepness and instability of slopes.

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4. The groundwater table separates between _____ and _____ zones.

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5. The types of drainage patterns are _____, _____, trellis and radial.

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6. Earthquakes cause damage through: _____, _____, _____, and _____.

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7. In terms of composition, the earth is subdivided into the following three parts (layers): _____, _____and _____.

8. _____(process) takes place along divergent plate boundaries, whereas, _____ (process) occurs along convergent plate boundaries.

Part III. Circle T = true or F = false and explain why if it is false (14 pts.)

T F 1. In the discontinuous reaction series the mineral (plagioclase feldspar) being crystallized is the same.

T F 2. Chemical stability is a measure of the tendency for a chemical substance to remain in a given chemical form.

T F 3. Facies are different sedimentary environments existing at the same time in different parts of a region.

T F 4. Half-life is the amount of radioactive material that decays into a daughter element during half its period.

T F 5. Mass movements are classified based on: 1) the nature of the material (rock or unconsolidated); 2) speed of the movement and 3) the latitudinal position of the area.

T F 6. Karst topography is characterized by a lack of surface streams, many caverns and very few sinkholes.

T F 7. When dust settles down it forms loess. Beds of loess lack internal stratification.

T F 8. An earthquake is a shaking or vibration of the ground caused by seismic waves that emanate from a fault that breaks suddenly.

T F 9. The largest seven plates are: North American, South American, Nazca, Pacific, Indo-Australian, Antarctica, and Eurasian plates.

Part IV. Answer only two of the following three questions (20 pts.)

1. Indicate and discuss the sedimentary structures, draw schemes.
2. Explain why and how stream meander and how ox-bow lakes form, draw schemes.
3. Explain how the distance between the epicenter and seismic station is found, and how to locate the epicenters of earthquakes.

Good Luck