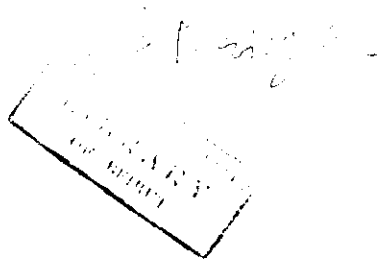




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AMERICAN UNIVERSITY OF BEIRUT
Geology Department
Geology 101 (section 1) (1)
Final Exam

June 23, 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 their paper confiscated.
5. Make your answers clear (**confused answers will not be considered**).
6. If you finish in the **last five minutes**, remain seated **quietly** until all the exam papers have been collected.
7. **There is no penalty** in the first three parts, and concerning part IV answer **only two questions**.

THANK YOU FOR YOUR COOPERATION

Part I. Choose the best Answer (52 pts.)

1. The asthenosphere extends from the bottom of the lithosphere to an average depth of . . . km.

- a. 150 b. 300 c. 450 d. 600
-

2. When two continental plates collide they produce . . . such as

- a. mountain ranges . . . Himalayas b. volcanic arcs . . . Himalayas
c. mountain ranges . . . Andes d. volcanic arcs . . . Andes
-

3. Upon . . . stress the object is

- a. compressive . . . pulled apart b. shearing . . . pulled apart
c. compressive . . . squeezed d. shearing . . . squeezed
-

4. San Andreas fault is an example of . . . plate boundaries.

- a. continental convergent b. oceanic convergent
c. divergent d. transform
-

5. The ground motion caused by an earthquake of magnitude 7 (Richter scale) is . . . times more than that of an earthquake of magnitude 4.

- a. 100 b. 900 c. 1000 d. 27000
-



6. Tsunamis are the result of an earthquake under . . . , and they travel at speed of up to . . . km/hr.

- | | |
|-------------------|-------------------------|
| a. sea . . . 100 | b. continent . . . 100 |
| c. sea . . . 1000 | d. continent . . . 1000 |
-

7. In earthquake terms, when movement occurs gradually along faults it is called:

- | | |
|------------------|--------------------|
| a. aseismic slip | b. elastic rebound |
| c. seismic slip | d. seismic gap |
-

8. Outwash plains belong to . . . plains.

- | | | | |
|-----------|---------|-------------|------------|
| a. marine | b. lake | c. alluvial | d. glacial |
|-----------|---------|-------------|------------|
-

9. Antarctica glaciers belong to . . . glaciers.

- | | |
|-----------|----------------|
| a. Alpine | b. continental |
| c. valley | d. mountain |
-

10. . . is the result of deflation.

- | | |
|--------------------|------------|
| a. Desert pavement | b. Dune |
| c. Ventifact | d. Moraine |
-

11. The . . . desert is a typical example of tropical latitude deserts.

- | | |
|-------------------|------------------------|
| a. Central Asian | b. coastal S. American |
| c. African Sahara | d. Nevada |
-

12. Soil-moisture water is held in . . . zone . . . water table.

- | | |
|-------------------------|-------------------------|
| a. phreatic . . . below | b. phreatic . . . above |
| c. vadoze . . . below | d. vadoze . . . above |
-

13. The confined aquifer is bounded by . . . rock from above, and by . . . rock from below.

- | | |
|----------------------------------|--------------------------------|
| a. impermeable . . . impermeable | b. permeable . . . impermeable |
| c. impermeable . . . permeable | d. permeable . . . permeable |
-

14. . . . resides in the zone of saturation only.

- a. subsurface water
 - b. groundwater
 - c. soil moisture
 - d. perched water
-

15. Nonmetallic minerals include:

- a. sulfur, lead, cobalt and halite
 - b. phosphate, gypsum, halite and sulfur
 - c. lead, zinc, nickel and cobalt
 - d. bauxite, sand, clay and gravel.
-

16. Asbestos is a typical example of . . . deposits.

- a. magmatic
 - b. hydrothermal
 - c. metamorphic
 - d. sedimentary
-

17. Over the last decade the production of ... has increased and that of ... has declined.

- a. Copper and lead . . . zinc
 - b. zinc and lead . . . copper
 - c. Zinc . . . copper and lead
 - d. copper and zinc . . . lead
-

18. Oil and natural gas are believed to form from . . . buried by sediment.

- a. marine microorganisms
 - b. land microorganisms
 - c. marine plants
 - d. land plants
-

19. The amount of time required for oil formation is not known precisely but the process is generally ... Therefore, oil and natural gas are among the ... energy sources.

- a. slow . . . renewable
 - b. fast . . . renewable
 - c. slow . . . non-renewable
 - d. fast . . . non-renewable
-

20. The geopressurized natural gas is met at ... depths, and also provides us with ... energy.

- a. shallow . . . geothermal
 - b. great . . . geothermal
 - c. shallow . . . mechanical
 - d. great . . . mechanical
-

21. The radioactive elements that can be activated in a chain-reaction process are:

- a. Uranium-235 and plutonium-239
 - b. Uranium-235 and Uranium-238
 - c. Thorium-232 and Plutonium-239
 - d. Thorium-232 and Uranium-238
-

22. ... is not a form of solar energy.

- a. Hydropower
 - b. Wind energy
 - c. Biomass
 - d. Tidal power
-

23. ... wastes are the least in amounts, however they attract most of people's attention.

- a. Mineral extraction and processing
 - b. Municipal and industrial
 - c. Crop and animal
 - d. Crop and industrial
-

24. In anaerobic conditions the decomposition of wastes produce:

- a. CO₂ and H₂S
 - b. CO₂ and SO₂
 - c. CH₄ and H₂S
 - d. CH₄ and SO₂
-

25. Typical nonpoint pollution sources are:

- a. fertilizer runoff, septic tank, and roadsalt runoff
 - b. fertilizer runoff, strip-mine acid drainage and roadsalt runoff
 - c. sewer outlet, steel mill and septic tank
 - d. sewer outlet, strip-mine acid drainage and septic tank
-

26. The most toxic, to humans or other life forms, agricultural pollutions are:

- a. fertilizers
 - b. spoil banks
 - c. sediment pollution
 - d. herbicides and pesticides
-

Part II. Circle T = true or F= false, and explain why if it is false (22 pts.)

T F 1. Convection cells is the most widely accepted explanation for the driving force of plate motion.

T F 2. The axial zone of the Red Sea is a typical example of transform-fault plate boundary.

T F 3. Surface seismic waves are subdivided into compressional and shear waves.

T F 4. The earthquake control comprises unlocking locked faults by hammering the ground and fluid injection.

T F 5. The equilibrium line of glaciers is the line separating between ablation and accumulation areas.

T F 6. Air moves from place to place mainly in response to differences in pressure, which is caused mainly by topographic features (mountains and valleys).

T F 7. Climate is the result of the interplay of a number of factors, mainly: indoor heating and cooling, industry and water pollution.

T F 8. Cone of depression is a circular lowering of the water table immediately around the well which forms upon pumping water from an unconfined aquifer.

T F 9. "ppb" is a measure of water quality used for highly concentrated solutions.

T F 10. Placers are deposits mechanically (physically) concentrated by water movement and sorted by size and density.

T F 11. Open-pit mining is more often used to extract coal or when the material of interest occurs in a layer near, and approximately parallel to, the surface.

T F 12. Fusion is the process by which the sun generates its energy, where simple hydrogen nuclei are fused.

T F 13. In a septic system waste water is transferred to a settling tank and the remaining liquid seeps out through porous perforated pipes into the soil of the leaching field.

T F 14. The longer the residence time of a pollutant in a reservoir, the lower the environmental impacts.

Part III. Match the relevant terminologies (one to one) in the following two columns (6 pts.)

- | | |
|------------------------------|---------------------------|
| 1. convergent plate boundary | _____ evaporites |
| 2. divergent plate boundary | _____ San Andreas fault |
| 3. earthquake focus | _____ graphite |
| 4. transform boundary | _____ Alps |
| 5. calving | _____ till |
| 6. glacial drift | _____ surface subsidence |
| 7. artesian system | _____ manganese nodules |
| 8. excessive pumping | _____ sea floor spreading |
| 9. sinkholes | _____ icebergs |
| 10. sedimentary deposits | _____ karst |
| 11. marine mineral resources | _____ epicenter |
| 12. metamorphic deposits | _____ confined aquifer |
-

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

1. Discuss locating the epicenter, including calculating the distance to the earthquake station (draw schemes).
2. Review the causes of natural deserts and name their types.
3. Discuss solar energy, including solar heating and electricity, and the potential environmental impacts of large-scale commitment to solar electricity.

GOOD LUCK