



American University of Beirut
Geology Department
Geol. 225
Final Exam



June 12, 2000

Student Name: _____

Part I. Choose the best answer (30pts.)

1. The . . . is the instrument most widely used in gravitational surveys.
a. gradiometer
b. gravimeter
c. torsion balance
d. pendulum

2. The . . . method (electrical surveys) uses an electric current applied to the ground by two electrodes and the potential is measured by two other electrodes.
a. inductive
b. electric transient
c. conductive
d. telluric

3. In seismic exploration, . . . is the instrument that transforms the mechanical motion into an electromagnetic signal.
a. geophone
b. vibroseis
c. dynoseis
d. seismogram

4. . . . waves, are body waves that propagate only through solids.
a. Longitudinal
b. Rayleigh
c. Compressional
d. Shear

5. Gravity variations are of the order of one part of . . . of the total value of gravity.
a. 10,000,000
b. 100,000
c. 10,000
d. 1000

6. . . . corrections are applied to compensate for the material between the sea level and the level of the station (gravitational surveys).
a. Free-air
b. Latitude
c. Terrain
d. Bouguer



7. . . . modeling refers mostly to simulating the thermal history and the timing and volume of hydrocarbon generation as well as migration and accumulation.

- a. Groundwater fluid flow
 - b. Basin
 - c. Basin-fill
 - d. Tectonic deformation
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8. . . . analysis provides the most crucial input to the Conceptual Model.

- a. Structural
 - b. Tectonic
 - c. Stratigraphic
 - d. Lithological
-

9. The units of . . . column . . . contain major hiatus or unconformity.

- a. tectonic . . . should not
 - b. stratigraphic . . . should not
 - c. tectonic . . . may
 - d. stratigraphic . . . may
-

10. Initial porosities depend on:

- a. sorting, grain shape, solubility and cementation
 - b. grain size, sedimentation rate, solubility and cementation
 - c. sorting, grain shape, grain size and sedimentation rate
 - d. grain shape, sorting, solubility and recrystallization
-

11. Below the bubble-point pressure the crude oil is . . . and there is . . . gas cap.

- a. oversaturated . . . a
 - b. undersaturated . . . a
 - c. oversaturated . . . not
 - d. undersaturated . . . not
-

12. The most efficient primary producing mechanism is the

- a. dissolved-gas drive
 - b. water drive
 - c. gas-lift swabbing
 - d. gas-cap drive
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Part II. Circle T= true or F= false and explain why if it is false (20 pts.)

T F 1. The basic correction that must be applied in magnetic surveys are for the elevation and diurnal variation, whereas during magnetic storms measurements are suspended.

T F 2. Seismic survey at sea is considerably more rapid than on land, since no boreholes to drill or networks of geophones to lay out by hand.

T F 3. A sedimentary geologic basin is the result of the sum of all geologic, geophysical, and geochemical processes having acted on its component parts during its entire geologic history.

T F 4. The eustatic sea level fluctuations usually are slower than those of isostatic adjustments.

T F 5. Surface water temperature is a function of longitude, oceanic currents, long-term climatic change, seasonal events and water depth.

T F 6. The permeability is a function of the hydraulic head, flow rate and the viscosity of the fluid or gas.

T F 7. Dry samples have higher thermal conductivities than wet samples.

T F 8. Salt bodies act as conductive pipes due to their relatively higher thermal conductivities and porosities.

T F 9. Vitrinite reflectance is the most widely used parameter to indicate maturity of the source rock.

T F 10. The formation volume factor is the ratio of the volume of liquid under the reservoir pressure to its volume under surface pressure.

Part III. Answer only four of the following six questions (50 pts.).

1. Indicate the types of seismic waves and introduce the equipment used in seismic methods, draw schemes.
2. Discuss the classification and characterization of basins in terms of their tectonic origin (plate-tectonic position), draw the scheme.
3. Discuss the filling of the sedimentary basin: stratigraphic and lithofacies.
4. Introduce the accumulation rates and subsidence: the burial history. Draw a scheme showing the subsidence and sediment accumulation through time for a well and the correction for compaction.
5. Discuss the erosion of overburden and the estimation of maximum burial (Post-depositional Processes).
6. Describe the enhanced oil recovery (EOR) techniques.

GOOD LUCK

