American University of Beirut
Department of Geology
Geol.219
Final exam

Student Name and Number:_____ May 14, 1999

Part I. Circle T = true or F = false and explain why if it is false (40 pts.)

T F 1. The topographic map is the traditional base for geologic mapping.

T F 2. It is preferred to choose pleasant colors (in mapping) for thin beds or key marker units and bright or strongly contrasting colors for rock units that cover large areas.

T F 3. For purpose of detailed structural analysis or as an aid in clarifying the structural style, marker units are chosen on the basis of distinctiveness, resistance to erosion and continuity.

T F 4. Geologic maps are made in the field, not constructed in the office at the end of the day.

T F 5. Butress unconformity forms when sediment or volcanics above the unconformity lap up against a steep sided island, hill of scarp.

T F 6. Primary structures originate immediately after the lithification of sediment, after lava stops moving and becomes volcanic rock, and after an intruding magma solidifies

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T F 7. The top of the pillow structure in vertical cross section show lobes projecting upward. They are valuable facing indicators even within metamorphosed basalts.

T F 8. The line of strike is a horizontal line, whereas the line of dip is the line of steepest inclination.

T F 9. The line of geologic cross section is laid out obliquely to the average trend.

T F 10. The topographic profile of geologic cross sections is constructed with little vertical exaggeration.

T F 11. The line of section is positioned where strike and dip data are abundant and where the fold pattern are especially interesting and informative.

T F 12. Homoclines are simple tilted structures where bedding dips uniformly in two opposite directions and their structure contour maps are characterized by sub-parallel contour lines.

T F 13. Orthographic projection preserves spatial relations among structures, but stereographic projection displays geometries and orientations of lines and planes without regard to spatial relations.

T F 14. The Schmidt stereonet is an equal-angle net, whereas the Wulff stereonet is an equal-area net.

T F 15. The rake (or pitch) is the angle between a line and the dip direction of the plane in which the line is found.

T F 16. In measuring the orientations of joints and shear fractures the inventory method requires measuring and classifying every single joint and shear fracture at a station site.

Part II. Answer four of the following seven questions (60 pts.).

1. A. Explain how paced distances over irregular topography (slope) are converted to true horizontal map distances, draw a scheme.
   B. Name the basic tools for geologic mapping (Ex. covered clipboard).

2. Discuss the unconformities and explain how they are detected during geologic mapping.

3. Indicate the types of primary structures and how they are used to determine the "way up" within sedimentary sequences.

4. Indicate and explain the main steps in constructing geological cross sections.

5. Drawing the needed steps (at least 6), find the trend and plunge of the line of intersection of the following planes: P1- striking N62° E and dipping 45° SE; and P2-striking N54° W and dipping 35° NE.

6. Discuss the stereographic projection as a statistical tool and explain how the preferred orientations are evaluated.

7. Discuss the preparation of fracture-orientation diagrams including stereographic pole diagram, rock diagrams and frequency diagrams (strike histograms).

GOOD LUCK