

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF PHYSICAL SCIENCES
DEPARTMENT OF GEOLOGY

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BTech GEOLOGY
2017/2018 SESSION

COURSE CODE: GEL 213

UNIT: 2

COURSE TITLE: MAP INTERPRETATION

INSTRUCTIONS: ANSWER ANY THREE QUESTIONS. SHOW ALL NECESSARY STEPS IN QUESTIONS THAT NEED CALCULATIONS

TIME ALLOWED: 2 HOURS

DATE: 30 APRIL 2018

1. a. Write short notes on the following:
 - (i) Map Interpretation.
 - (ii) Coordinate Systems.
 - (iii) Main components of a map.
 - (iv) Contours and its rules.
 - b. Produce accurate linear scales using the following representative fractions and state its statement scale.
 - (i) 1:250,000
 - (ii) 1:100,000
 - (iii) 1:50,000
 - c.
 - (i) Convert the following coordinates in Decimal degrees to Degrees Minutes and Seconds format.
6.5253, 6.1586, 9.2365, 9.8652
 - (ii) Convert the following coordinates in Degrees, Minutes, Seconds to Decimal Degrees
9°21'15", 9°18'20", 6°10'30", 6°15'25".
2. a. Briefly explain THREE reasons why topographical maps are important in a geologic mapping exercise.
 - b. Explain the characteristics of contours in a topographic map.
 - c. Produce an accurate hypothetical STANDARD topographic map with dimensions 15cm by 15 cm to be used by 200 Level Geology students. It covers Latitudes 9° 00'00" and 9° 15'00" and Longitudes 6°30'00" and 6°45'00". Name this map.
 - i. Make a 6 x 6 grid of this map, label appropriately and calculate the total area to be covered by the students.
 - ii. If a portion of this map is carved out with dimensions of 2cm by 2cm and thereafter, enlarged 3 times, what is the scale of the new map?
3. a. Geological maps are fundamental to the study of geosciences. Briefly explain why.
 - b. 200 Level geology students carried out field mapping in Paiko and recorded the following joint values:

Table 1: Joint values

150	098	130	034	024	150	146
140	070	160	120	023	140	050
100	110	146	060	030	030	030
039	032	070	152	040	026	148
030	020	040	054	030	090	125
086	045	050	140	050	090	120
010	060	030	034	170	090	043
020	060	025	134	160	034	030
018	142	026	108	028	160	028
045	120	092	026	149	010	144

(i) Use the joint direction values to construct a Rosette diagram.

(ii) Briefly explain the implication of your diagram to a Mineral Explorationists, Hydrogeologist and an Engineering geologist.

C. Name and explain the functions of the two major agencies responsible for the production of maps used in the study of geosciences. List Five (5) of these maps.

4.
 - a. List any five specialised maps that are relevant in geosciences
 - b. List and explain five principles that govern the determination of relative ages of rocks.
 - c. Use the hypothetical map attached to answer the following question.
 - i) Draw an accurate section along the line provided.
 - ii) Describe the geology of the area under the following headings:
 1. Aerial distribution of rock types
 2. Geomorphology
 3. Geological history
5.
 - a) Discuss the necessary steps that must be taken to ensure a hitch-free geologic mapping exercise
 - b) List and describe six field equipment for geological mapping
 - c) The data presented in the table below represents information acquired by 200 level Geology students during their field work exercise. Use the information to produce a geologic map of the area assuming that all contacts are inferred.
 - d.) Assuming that the map is on a scale of 1:25,000, calculate the total area mapped by the students.

LOCATION NO.	LONGITUDE (E)	LATITUDE (N)	ROCK TYPE	DESIGNATED COLOUR
1	6.5500	9.1750	Gneiss	Brown
2	6.5500	9.1417	Gneiss	Brown
3	6.5750	9.1250	Gneiss	Brown
4	6.6000	9.1000	Gneiss	Brown
5	6.5500	9.0500	Gneiss	Brown
6	6.6500	9.0250	Gneiss	Brown
7	6.5333	9.2167	Amphibolite	Green
8	6.7000	9.0250	Amphibolite	Green
9	6.6500	9.1000	Amphibolite	Green
10	6.7000	9.1167	Amphibolite	Green
11	6.6500	9.1417	Amphibolite	Green
12	6.6250	9.1833	Schist	Blue
13	6.6750	9.2167	Schist	Blue
14	6.7167	9.2250	Schist	Blue
15	6.7333	9.2167	Schist	Blue
16	6.7167	9.1833	Schist	Blue
17	6.7250	9.1667	Schist	Blue
18	6.7167	9.1167	Schist	Blue