

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

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BTech GEOLOGY 2015/2016 SESSION
COURSE: GEL 214 (MAP INTERPRETATION) UNIT: 2
DATE: TIME ALLOWED: 2 HOURS

Instructions: Answer THREE questions only. Show all necessary steps in questions that need calculations.

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. (i) Convert the following coordinates in Decimal degrees to Degrees Minutes and Seconds format.
6.5753, 6.1596, 9.4365 and 9.6652
(ii) Convert the following coordinates in Degrees, Minutes, Seconds to Decimal Degrees
9°21'45", 9°18'40", 6°10'20" and 6°25'25"
 - c. EKELE is a hypothetical geological map of an area consisting of Limestone, Shale, Sandstones and Conglomerate. Draw an accurate geologic cross-section on a scale of 1cm to 100m along the line X – Y and describe the geological history of the area.
2. a. Geological maps are fundamental to the study of Geosciences. Briefly explain.
* b. Write short notes on four major categories of geological maps.
c. Write briefly on the following:
 - (i) Brittle and ductile structures
 - (ii) Dextral and sinistral faulting
 - (iii) Antiform and synform
 - (iv) Law of Inclusion
 - (v) Geologic cross-sections
3. (a) With explicit diagrams, give full account of Unconformities.
(b) Give an account of structural feature like fractures on rocks.
(c) The following joint values (in degrees) were measured and recorded during 200L field mapping exercise.
 - (i) Draw a Rose plot of these values.
 - (ii) State the principal joint directions direction(s).
 - (iii) Give a concise account of the implications of these directions to
 1. Mineral prospector
 2. A Hydrogeologist.
 3. An Engineering geologist.

028	025	030	035	038	034	029	070	120	123
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129	170	175	180	178	160	059	018	176	020
006	021	019	016	110	092	034	055	053	059
058	068	009	006	003	004	100	109	005	039
116	138	137	109	137	044	058	049	063	078

4. (a) Briefly explain THREE reasons why topographical maps are important in the study of geology.
- (b) The map provided is a hypothetical standard map of MOPPA SHEET 234 NW that was mapped by Geology students. It covers Latitudes $9^{\circ} 00'00''$ and $9^{\circ} 15'00''$ and Longitudes $6^{\circ}30'00''$ and $6^{\circ}45'00''$. Study it carefully and answer the following questions.
- What is the total area covered by the students?
 - Make a 6 x 6 grid of this map and label appropriately.

TABLE I

LOCATIO N NO	Longitude(E)	Latitude (N)	ROCK TYPE	DESIGNATED COLOUR
1	$6^{\circ}33'00''$	$9^{\circ}10'30''$	Gneiss	Brown
2	$6^{\circ}33'00''$	$9^{\circ}08'30''$	Gneiss	Brown
3	$6^{\circ}34'30''$	$9^{\circ}07'30''$	Gneiss	Brown
4	$6^{\circ}36'00''$	$9^{\circ}06'00''$	Gneiss	Brown
5	$6^{\circ}33'00''$	$9^{\circ}03'00''$	Gneiss	Brown
6	$6^{\circ}39'00''$	$9^{\circ}01'30''$	Gneiss	Brown
7	$6^{\circ}32'00''$	$9^{\circ}13'00''$	Amphibol ite	Green
8	$6^{\circ}42'00''$	$9^{\circ}01'30''$	Amphibol ite	Green
9	$6^{\circ}39'00''$	$9^{\circ}06'00''$	Amphibol ite	Green
10	$6^{\circ}42'00''$	$9^{\circ}07'00''$	Amphibol ite	Green

11	6°39'0 0"	9°08'30"	Amphibol ite	Green
12	6°37'3 0"	9°11'00	Amphibol ite	Green
13	6°40'3 0"	9°13'00"	Schist	Blue
14	6°43'0 0"	9°13'30"	Schist	Blue
15	6°44'0 0	9°13'00"	Schist	Blue
16	6°43'0 0"	9.11'00"	Schist	Blue
17	6°42'3 0"	9°10'00"	Schist	Blue
18	6°43'0 0"	9°07'00"	Schist	Blue

- c. Produce a good geological map of the area assuming all the contacts were inferred.

MOPPA SHEET 234 NW

