UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

SECOND SEMESTER EXAMINATIONS, MAY 2018

COURSE NO: GM 376
COURSE NAME: **ADVANCED GEODESY**
CLASS: GM III **TIME**: 3 HOURS

Name**:** _____Index Number: _____

SECTION A (A total mark of 20 is to be awarded)

Answer all questions in this section

1. State one reason why there is the need to perform coordinate transformation. [1 mark]
2. State three factors that influence the choice of the most appropriate coordinate transformation model for an area. [3 marks]
3. Briefly explain the key roles played by what constitute transformation parameters. [3 marks]
4. Explain how the statistical validity of the transformation parameters could be carried out. [2 marks]
5. State three requirements for selecting height systems. [3 marks]
6. State two factors that affect the quality of a coordinate transformation. [2 marks]
7. Explain with formulae the concept of the following height systems and the conditions under which each could be applied. [2 marks each]
   i. Dynamic heights
   ii. Orthometric Heights
   iii. Normal Heights

SECTION B (A total mark of 40 is to be awarded)

Answer Question 1 and any other one in this section. All questions must be solved in 3 decimal places.

Question 1 (Compulsory)

A, B, and C are points connected by a geometric levelling line. Given that the normal gravity at a latitude of 45º is 9.806 294 ms^{-2}, complete the following table:

Station	Gravity (Gal)	Height Increment (m)	Geopotential Number (gpu)	Dynamic Height (m)	Helmert Height (m)
A	979.88696	-	664.982	?	?
B	?	-0.541	?	677.577	?
C	979.88665	?	?	?	657.134

[20 marks]

Question 2

Discuss the methods of space geodetic measurements in geodesy.

[20 marks]

Question 3

(a) A geodesy research group have been given the task to establish a quasi-geoid model for the University of Mines and Technology campus. As a geodesist, discuss how the assigned task could be achieved. [8 marks]

(b) Describe the overview of establishing a national gravity network. [12 marks]

[20 marks]

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