UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

FIRST SEMESTER EXAMINATIONS, NOV/DEC. 2018

COURSE NO: **GM 171**
COURSE NAME: **Introduction to Geomatics**
CLASS: **GM I** **TIME: 31/2 HOURS**

Name**:** _____Index Number: _____

Section A (A total mark of 11 is to be awarded)

Fill in the blanks with suitable word(s)

1. Surveying is the art of determining_____positions of different features on the surface of the earth.
2. The object of surveying is the preparation of_____of the area.
3. Surveying is the first_____for the execution of any Engineering Project.
4. Surveys, in which curvature of the earth is ignored, are known as_____surveys whereas surveys, in which curvature of the earth is taken into account, are known as_____surveys.
5. Surveys which are carried out to depict the general topography of the terrain are known as_____surveys.
6. The main principle of surveying is to work from the_____to the_____
7. Location of a point can be fixed with respect to given two points by measuring_____between the known point and the point.
8. Levelling is a branch of surveying in which measurements are made in_____plane.
9. A level surface is a curved surface which is_____to the vertical at each point.

10. A line which is normal to the plumb line at all points is known as_____line.

11. Horizontal line is_____to the vertical line at the point.

12. A vertical line at any point is defined by the_____line.

13. A level surface to which elevations of different points are referred to is known a_____

14. A relatively permanent point of referenc whose elevation with respect to any assumed datum is known as_____

15. A level essentially consists of the following four parts:

    (a)_____

    (b)_____

    (c)_____

    (d)_____

16. The arithmetical checks on reduction of levels by rise and fall method are_____=_____=_____

17. If the R.L. of a B.M. is 200.000 m, back sight is 1.525 m and fore sight is 3.285 m, R.L. of the forward station will be_____

Section B (A total mark of 9 is to be awarded)

Underline suitable words given in the brackets to fill in the blanks:

1. Chain surveying is most suitable when ground is fairly level with ……details

   (Simple, Crowded)

2. A system of surveying in which sides of various triangles are measured directly in the field with a chain and no angular measurement taken is known as…….surveying.

   (Compass, Planetable, Chain)

3. The principle of chain surveying is to divide the area into……

   (Triangles, Rectangles, Squares)

4. A chain triangle is said to be well-conditioned if none of its angle is less than…….

   (10°, 20°, 30°, 40°)

5. A straight line joining a station on a main survey line and another station on another survey line is called a…….line. (Subsidiary, Tie, Check)

6. The longest chain line passing through the center of the area is known as……

   (Survey, Chain, Base)

7. The survey line provided to check the accuracy of frame work is known as…….line.

   (Check, Subsidiary, Tie)

8. To range a line across a mound with ends not visible, method of……ranging is used.

   (Direct, Indirect)

9. The method of stepping is used for measuring horizontal distances in the case of…….surface.

   (Level, Undulating, Sloping)

10. Compass survey is suitable where…….is the main consideration.

    (Accuracy, Speed)

11. The box of the compass is made of……..

(Brass, Iron, Aluminium)

12. The north end of a magnetic needle deflects…….in the northern hemisphere.

(Upwards, Downwards)

13. The sum of the interior angles of a closed traverse is equal to…….right angles, where n is the number of its sides. (4n-2, 2n-4, 4^n-2, 2^n-4)

14. Fore and back bearings of a line whose end stations is free from local attraction, should differ by……. (180°, 90°, 360°)

15. …….meridian of a place changes its position with time.

(Arbitary, Magnetic)

16. Angle of inclination between the longitudinal axis of a magnetic needle and the horizontal plane at its pivot is known as…… (Dip, Declination, Bearing)

17. Imaginary lines joining the points having same dip on the surface of the earth are known as……..lines. (Agonic, Isoclinic)

18. True meridian at any place is…….. (Variable, Not variable)

Section C (A total mark of 40 is to be awarded)

Attempt All Questions in your Answer Booklet

Question One

a) Briefly explain two sources of errors in GPS work [4 marks]

b) The following is the pages of a level field book calculates RL of all points and check the accuracy of calculations. [6 marks]

Table 1:Level Field-Book

Stn. No	BS	IS	FS	Rise	Fall	RL
1	3.250					224.960
2	1.880		3.850			
3		2.250				
4	2.525		1.920			
5		2.540				
6	2.115		1.540			
7	1.175		2.105			
8		1.625				
9	0.505		1.895			
10			1.255			

Question Two

a) The following tacheometric observations (Table 2) were made on two points *P* and *Q* from station A. The height of the tacheometer at A above the ground was 1.55 m. Determine the

elevations of P and Q if the elevation of A is 75.500 m. The stadia constant A and B are respectively 100 and 0.00 m. [5 marks]

Table 2: Field Data

Staff at	Vertical angle	Staff reading		
		Upper	Middle	Lower
P	5°12'	1.388	0.978	0.610
Q	27°35'	1.604	1.286	0.997

b) From the information given in table 2 calculate the closing error in the eastings and the northings using the Bowditch method and hence determine the corrected values of station co-ordinates using the traverse computation sheet if the known co-ordinates of station A are 1500 N and 650 E. [25 marks]

Table 3: Field Data

Station	Line	Length (m)	Bearing
A	AB	293	045°10' 00"
B	BC	721	072°05' 00"
C	CD	496	161°52' 00"
D	DE	522	228°43' 00"
E	EA	762	300°42' 00"

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