MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2013/2014

FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN EARTH SCIENCE WITH INFORMATION TECHNOLOGY

(MAIN CAMPUS)

NGA 103: SURVEYING I

Date: 25th November, 2013 *Time: 11.00 a.m. - 1.00 p.m.*

INSTRUCTIONS:

- **Answer Question ONE and any other TWO questions.**
- **Sketch maps and diagrams should be used whenever appropriate.**

NGA 103 SURVEYING I

1. (a) Define the following terms
   (i) Surveying — 2 marks
   (ii) Declination — 2 marks
   (iii) Triangulation — 2 marks
   (iv) Barometric levelling — 2 marks

   (b) Describe the procedure of executing a chain survey.

   8 marks

   (c) The following consecutive readings were taken with a dumpy level: 0.565, 0.854, 0.940, 1.005, 0.640, 0.660, 0.785, 0.800, 0.635, 1.135, and 1.420. The level was shifted after the fourth and the seventh readings. The first reading was taken on the bench mark of Reduced Level (R.L) is 100.565m. Calculate the reduced levels of the change points, and the difference of level between the first and last points.

   14 marks

2. (a) Discuss specific corrections that are needed in chain surveying.

   12 marks

   (b) Examine common systems of angle measurements.

   8 marks

3. (a) A survey was conducted with a 30 m chain and plan of the field was drawn to a scale of 1 cm = 5 m. The area of the plan was found to be 62.80 cm^2. However when the chain was tested at the end of work, it was found to be 30.10 m. Assuming the length was exactly 30.00 m in the beginning of survey work, determine the true area of the field.

   8 marks

   (b) Show from first principles that when using the optical square, the image is formed at right angle to the chain line.

   7 marks

   (c) The magnetic bearings of a line is S47°30'E and the magnetic declination is 8°20'E. Determine the true bearing of the line.

   5 marks

4. (a) Two points on the opposite sides of a lake, D and E, are 355.5m and 276.2m, respectively, from the third point, F, on the shore. The lines joining points D and E with point F intersect at an angle of 71°45'. Determine the distance DE.

6 marks

(b) Examine the differences between prismatic and surveyors compass.

8 marks

(c) Enumerate the advantages of using a Total Station in surveying.

6 marks

5. (a) In taping from A to B, a tree on-line necessitated setting an intermediate point C offset 4.5 m to the side of the line AB. Line AC was then measured as 368.92 m along uniform 4% slope. Line CB on horizontal ground was measured as 285.10 m. Determine the horizontal length of AB.

6 marks

(b) Discuss the importance of survey in hydrology and water resources management.

10 marks

6. (a) Explain how temporary adjustment of the dumpy level is carried out

6 marks

(b) In a closed traverse, the following bearings were observed, with a compass. Calculate their interior angles and then compute the corrected magnetic bearings:

Line	Fore bearing (F.B)	Back bearing (B.B)
AB	46° 30'	226° 30'
BC	118° 30'	300° 15'
CD	210° 00'	28° 00'
DE	271° 15'	93° 15'
EA	313° 45'	132° 00'

14 marks