KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2010/2011

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF ENVIRONMENTAL PLANNING AND MANAGEMENT

EPM 232: ENVIRONMENTAL SURVEYING II

DATE: Thursday 25th November, 2010 **TIME:** 8.00 a.m. – 10.00 a.m.

INSTRUCTIONS

Answer question ONE and any other TWO.

1. a) Using suitable diagrams, distinguish between the following terms as applied in leveling:
   i) Datum and benchmark
   ii) Level line and horizontal line
   iii) Height of collimation and Rise and fall methods. [10 marks]

   b) Discuss various types of instrumental errors that may affect the accuracy of leveling readings. [8 marks]

   c) The following consecutive staff readings were observed along the centerline of a proposed project at a common interval of 20m, the instrument having been changed after the 4th and 7th readings: 0.780, 1.535, 1.955, 2.450, 2.985, 3.480, 1.155, 1.960, 2.365, 3.640, 0.935, 1.045, 1.630 and 2.545. The reduced level of the first point which was also at the centre line is 1500.000.
   i) Rule out a page of a level field book and enter the reading
   ii) Reduce the readings using Height of collimation method
   iii) Calculate the gradient of the line joining the first and the last points. [12 marks]

2. a) Outline the procedure of:
   i) Determining tacheometric constants in stadia tacheometry. [6 marks]

ii) Producing a topographical map of an area using stadia tacheometry.

[9 marks]

b) What are the advantages and disadvantages of tacheometric survey. [5 marks]

3. The following table shows readings taken using a tacheometer with a multiplying constant of 100 and no additive constant. The instrument was set up at point P and sighted onto a leveling staff held vertically on Benchmark A, ten onto points B and C. If the reduced level of point A was 278.360m and the observations made are as presented in the table below, calculate:

i) The horizontal distance BC

ii) The reduced levels of points B and C

iii) The mean slope of line BC [20 marks]

Staff station	Stadia readings	Central hair reading	Vertical angle	Horizontal direction
A	2.310 1.464	1.884	$2^{o}00'$	
B	2.466 0.732	1.602	$3^{o}40'$	$32^{o}10'12"$
C	2.522 0.388	1.455	$-2^{o}30'$	$88^{o}50'53"$

4. a) Outline how the following operations are accomplished in plane table surveying:

i) Leveling up

ii) Centering

iii) Orientation [12 marks]

b) With the aid of a diagram, explain the method of radiation as used in plane table surveying. [8 marks]

5. (a) With regard to a theodolite, explain:

i) The its main features [8 marks]

ii) The setting up operations [7 marks]

b) What is a total station [5 marks]

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