AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
PUBLIC WORKS DEPARTMENT
3rd Year Civil

2nd Semester | 2014 - 2015 | Assignment 1

# Engineering Surveying

## Point Positioning

### Question 1:-

Explain briefly the following:

- Bearing of a line.
- Reduced bearing of a line.
- Departure and latitude of a line.
- The relation between the bearings of two lines and their subtended angle.

### Question 2:-

Compare between the different types of point positioning. Your comparison should cover the following items:

- Main idea.
- Measurements.
- Required instruments.
- Steps of graphical solution.
- Steps of analytical solution.
- Accessibility of control points.
- Accessibility of unknown points.
- Failure condition.
- Ill condition.
- Required field time.
- Required office time.

### Question 3:-

The coordinates (E, N) of points A and B are given as follows:
A(1542.214, 3054.098), B(1444.087, 3200.551).
Point (M) is lying to the left from the line AB. The perpendicular distance from M to AB is 39.210m, and the distance AM' is 43.515m (MM' is the perpendicular from M to AB). Find the coordinates of point M.

### Question 4:-

The coordinates (E, N) of points A and B are given as:
A (1403.197, 608.199), B (1511.197, 199.608)
To find out the coordinates of point (D), the following measurements were taken:
Length of AD = 546.213 m, angle BAD = 215° 21' 32".
Find the coordinates of point D.

## Question 5:-

To find out the length and bearing of the line HD, the following data were collected from the two control points A and B:

Angle HAB = 42° 33' 15" , Angle ABH = 63° 18' 08"

Length of AD = 355.15m, Length of BD = 256.087m

If point D is lying to the left from the line AB, coordinates of A and B are (5000, 8000) and (5214.021, 8333.305) respectively, find the length and bearing of the line HD.

## Question 6:-

Derive a formula to get the coordinates of point M, using two horizontal angles measured from M to three different control points T1, T2 and T3.

## Question 7:-

To find out the coordinates of point M, a theodolite was setup over it and the following angles were measured:

Angle AMB = 53° 18' 15" , angle BMC = 42° 31' 15"

If the coordinates of the points A, B and C are given as:

| Point | E | N |
|---|---|---|
| A | 1024.201 | 2154.265 |
| B | 1254.054 | 2301.201 |
| C | 1501.548 | 2187.254 |

Find the coordinates of point S.

## Question 8:-

Find the coordinates of point M if the coordinates of the two points A and B are (2541.321, 5124.321) and (2895.321, 4855.502), respectively. Length of MA is 300m and the angle BMA is 44° 08' 58"

Submission due date: During tutorial of week starting Saturday 21/02/2015
Also, a quiz about this assignment will be held during tutorial of the same week.

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