كلية الهندسة – جامعة القاهرة

شعبة هندسة الجيوماتكس

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Homework Assignment No. 4
Levelling Theory

Part A- Mark the correct answer for the following:

1. **Of the following, which are good reasons that Mean Sea Level is not a good vertical datum. 1. MSL is rising with polar ice melting 2. It changes in height along the coast 3. There's no sea in interior places.**
   a. ○ 1, 2, 3 b. ○ 2, 3 c. ○ 1, 3 d. ○ 1, 2

2. One of the following is not correct for the definition of geoid 1. Equipotential surface 2.Perpendicular to vertical line 3. Identical to Mean Sea Level 4. All the points have the same level.
   a. ○ 1 b. ○ 2 c. ○ 3 d. ○ 4

3. In Egypt a reference datum for leveling is:
   a. ○ MSL at Alexandria harbor 1906 b. ○ MSL at Alexandria harbor 1930
   c. ○ MSL at Suez Canal 1870 d. ○ Chart datum for Suez Canal 1900

4. In topographic surveying the control for elevations is called:
   a. ○ positional b. ○ horizontal c. ○ vertical d. ○ topographic

5. A point of reference that is at a known elevation is called a
   a. ○ benchmark b. ○ profile mark c. ○ height of instrument d. ○ bench height

6. A stable point, first of unknown elevation and then of known elevation, used to continue moving forward toward a desired point is referred to as a
   a. ○ fore sight b. ○ back sight c. ○ benchmark d. ○ turning point

Part B- Answer the followings:

1. Three readings i.e., 3.64m, 2.73m, and 0.62m were taken during leveling procedure to define the slope of centerline of a bridge at points A, B and C. If AB=BC = 50m, find the slopes of line AB, and line BC expressed as a percentage.

2. Find the level reading at the end of the water pipe with length 200m, if pipe slope is 1:200 downward and level reading at start point is 1.3m.

3. Sewage pipe starts at level 1.3m below nature ground surface i.e. 10.70m with slope 1:200 downward. Find depth of Man Hole MH at the end if level of end point is 9.00 m and length of pipe is 400m.

4. Find the slope and sag at the middle for electric cable carried on two towers distance apart is 100m, if reading taken with inverted staff at start , middle and end are 3.26m, 3.15m, 4.26m respectively.