Homework Assignment No. 6
Leveling Errors & Leveling Applications

Part A- Mark the correct answer for the following:

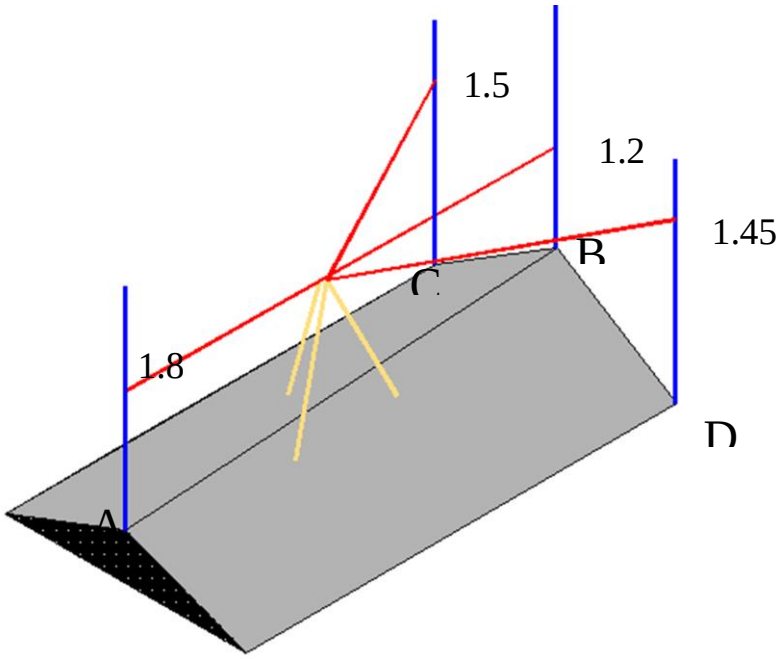
1. **During lab leveling session, one of the students adjusted level and observed staff, the next students was not able to see sharp image because:**
   a. ○ image was not received on diaphragm. b. ○ Cross hair was not clear
   c. ○ Image was not magnified well d. ○ None of the these
2. **Which of the following errors can not be eliminated by ensuring that backsights and foresights are of equal distance?**
   a. ○ Reading error of a staff. b. ○ Collimation error.
   c. ○ Error due to the Earth's curvature. d. ○ Error due to the refraction of the rays.
3. **In levels, parallax is caused by**
   a. ○ An incorrect setting of the compensator b. ○ An incorrect setting of the eyepiece and telescope focus c. ○ Moving the eye whilst looking through the telescope
   d. ○ Refraction along the line of sight causing it to bend
   e. ○ None of these
4. **Which of the following statements is incorrect regarding the collimation error in levelling?**
   a. ○ This error is created because the optical line of sight is not perfectly perpendicular to the direction of gravity (vertical line).
   b. ○ The effect can be minimized by setup the leveling instrument midway between the staffs.
   c. ○ Two Peg test can be performed to determine the size of the error.
   d. ○ Stadia level readings can be measured to minimize the collimation error.
5. **Maximum allowable Collimation error for level, according to the course text book is:**
   a. ○ 3mm/60m b. ○ 2mm/50m c. ○ 2mm/20m d. ○ None of these.
6. **During a two peg test, the level readings with level in the middle were 1.543 m at A and 1.330m at B. The readings in the second position with level close to point B were 1.685m at A and 1.468m. Distance AB was 60m. The collimation error is:**
   a. ○ 3mm/60m b. ○ 4mm/60m c. ○ 2mm/60m d. ○ None of these.

Part B- Answer the followings:

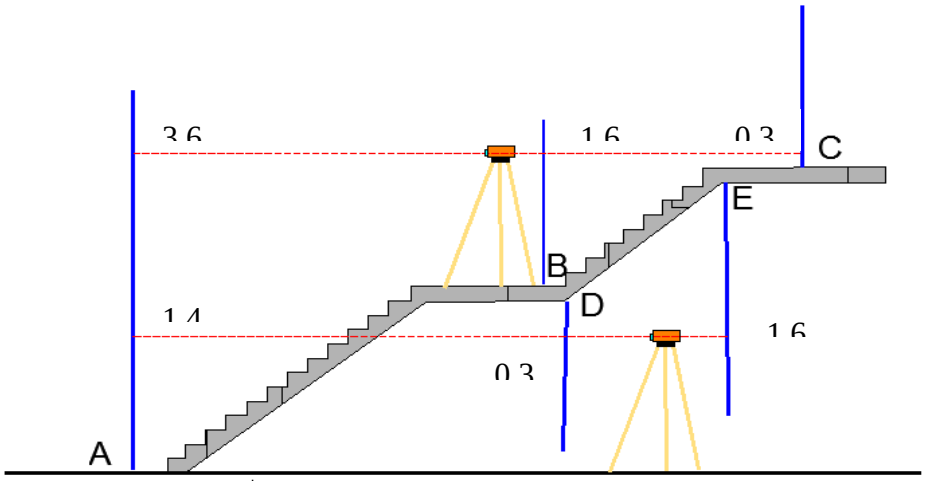
1. A level was checked for collimation error using a two-peg-test and the following results were obtained:

With the level midway between two pegs B1 and B2 which are 40 m apart:
Staff reading at B1 = 1.516 m staff reading at B2 = 1.581 m
Level set up near B1: Staff reading at B1 = 1.729 m Staff reading at B2 = 1.790 m
Calculate the collimation error in the level and the correct reading at B2 in second position.

2. During upgrade of an existing road, the level readings at A, B, C, and D along centerline of road (A,B) and two edges (C, D) are 1.8, 1.2, 1.5, and 1.45 resprctively. If distance AB is 80 m and BC is 15m and BD is 15 m find slopes for AB, BC, and BD. Also find levels of B, C, and D if level of A is 30 m.

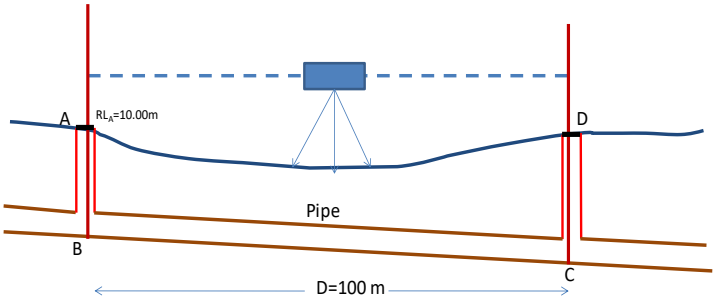


3. For the next figure, level readings at A, B, C, A, D, and E are taken to determine slab thickness. Find levels for B, C, D, and E if level of A is 20.0 m. and then find thickness between B& D and C & E



.S.	I.S.	F.S.	RISE	FALL	REDUCED LEVEL	Remarks
						A
						B
						C
						A
						D
						E

4. For the next figure, the level readings at A , B, C & D are 1.020, 2.220, 2.720, and 0.926 respectively. Level of A is 10.00 m. if horizontal distance AD=100m Find slope of pipe and levels of B, C &D.



5. For the next figure, arrange these reading using leveling Table. Given RL of A is 20m, Find the levels of B, C,D, and E. If distance CD is 40 m find the slope of CD.

B.S.	I.S.	F.S.	Rise	Fall	Reduced Level	Remarks
						A
						B
						C
						D
						E