

國立陽明交通大學 110 學年度第 2 學期 博士班資格考筆試考試試題

土木工程學系 測量組

科目：測量學及測量平差

選考學生數：2

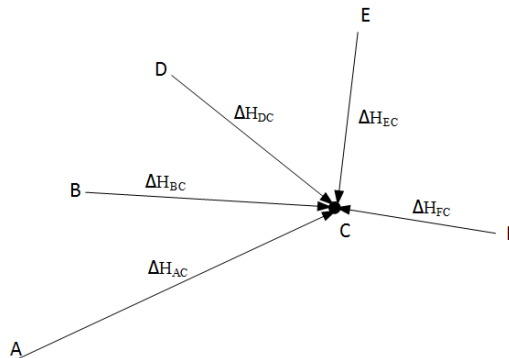
考試時間：120min

1. Please compare the error factors of **differential leveling**, **trigonometric leveling**, and **GNSS leveling** in determine the elevation (15%)
2. Why does the GNSS receivers have lower accuracy in the vertical component than its horizontal component? (15%)

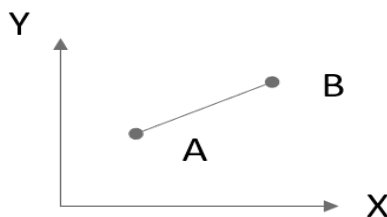
3. The following numbers are

$\Delta H_{AC}=9.020\text{m}$;	$\Delta H_{BC}=8.030\text{m}$;	$\Delta H_{EC}=6.970\text{m}$;	$\Delta H_{DC}=7.980\text{m}$;	$\Delta H_{FC}=9.030\text{m}$
$H_A=91.000\text{m}$;	$H_B=92.000\text{m}$;	$H_C=93.000\text{m}$;	$H_D=92.000\text{m}$;	$H_F=91.000\text{m}$;
$L_{AC}=640\text{m}$;	$L_{BC}=360\text{m}$;	$L_{EC}=320\text{m}$;	$L_{DC}=400\text{m}$;	$L_{FC}=360\text{m}$

$H_C=?$ (20%)



4. The figure shows points $A(X_A, Y_A)$ and $B(X_B, Y_B)$, whose standard deviations are σ_A and σ_B , respectively. Please address the accuracy of the distance between these two points and the accuracy of the azimuth from A to B? (20%)



5. Explain the following terms and show at least one example for each term.
- (a) An idempotent matrix (5%)
 - (b) Matrix equality (5%)
 - (c) Generalized inverse (5%)
6. Several methods of outlier detection are popular in the surveying literature. Explain the following methods
- (a) Tau test (5%)
 - (b) Data snooping (5%)
 - (c) Danish method (5%)

