

## 109 學年度四技二專第四次聯合模擬考試 土木與建築群 專業科目(二) 詳解

109-4-06-5

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	C	C	B	D	D	B	A	C	C	B	B	D	C	A	A	D	D	A	B
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
C	B	A	C	D	D	A	B	D	B	B	A	D	C	B	A	C	A	C	D

### 第一部分：測量實習

1. 以  $\frac{1}{2000}$  比例尺量得長 100 m，寬 40 m，修正以  $\frac{1}{1000}$  的比例尺，其長應為 200 m，寬為 80 m  
 真實面積 = 200 m × 80 m = 16000 m<sup>2</sup>  
 = 160 公畝 = 4840 坪 = 1.65 甲

2. 最或是值  

$$= 50.980 + \frac{(0.007 + 0.006 + 0.004 + 0.005 + 0.008)}{5}$$

$$= 50.986 \text{ m}$$

$$V_1 = 50.987 - 50.986 = 0.001 \text{ m} = +0.1 \text{ cm}$$

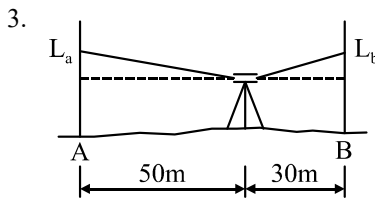
$$V_2 = 50.986 - 50.986 = 0 \text{ cm}$$

$$V_3 = 50.984 - 50.986 = -0.002 \text{ m} = -0.2 \text{ cm}$$

$$V_4 = 50.985 - 50.986 = -0.001 \text{ m} = -0.1 \text{ cm}$$

$$V_5 = 50.988 - 50.986 = +0.002 \text{ m} = +0.2 \text{ cm}$$

$$\sigma = \pm \sqrt{\frac{[vv]}{n(n-1)}} = \pm \sqrt{\frac{0.1}{5 \times 4}} = \pm 0.07 \text{ cm}$$



假設每 1 公尺有 1Δ 誤差

$$\frac{50\Delta}{50} = \frac{2 \cdot 20''}{206265''}, \quad \frac{30\Delta}{30} = \frac{2 \cdot 20''}{206265''}$$

$$\Delta = 0.19 \text{ mm}$$

$$\Delta h_{AB} = (L_a - 50\Delta) - (L_b - 30\Delta) = (L_a - L_b) - 20\Delta - 20\Delta = -3.8 \text{ mm}$$

4. 水準閉合差  

$$= 27.156 + [4.526] - [5.364] - 26.338 = -0.020 \text{ m}$$

6. 指標差 =  $\frac{Z_{正} + Z_{倒} - 360^\circ}{2}$   

$$-6'' = \frac{Z_{正} + 275^\circ 40' 18'' - 360^\circ}{2}$$

$$\therefore Z_{正} = 84^\circ 19' 30''$$

$$Z_{平} = Z_{正} - (-6'') = 84^\circ 19' 36''$$

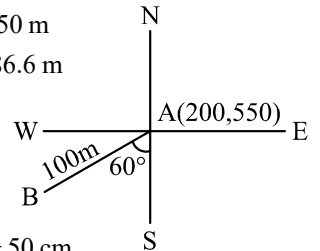
$$\alpha_{垂直角} = 90^\circ - Z_{平} = +5^\circ 40' 24''$$

8.  $\Delta N_{AB} = -100 \times \cos 60^\circ = -50 \text{ m}$

$$\Delta E_{AB} = -100 \times \sin 60^\circ = -86.6 \text{ m}$$

$$N_B = 550 - 50 = 500 \text{ m}$$

$$E_B = 200 - 86.6 = 113.4 \text{ m}$$

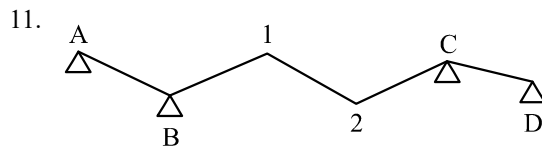


9.  $0.5 \text{ mm} \times 1000 = 500 \text{ mm} = 50 \text{ cm}$

現地測量誤差值需在 50 cm 以內  
 故甲、乙、丙三者符合

10. 測距精度 = 測角精度

$$\frac{\Delta}{45 \text{ m}} = \frac{1' 20''}{206265''}, \quad \Delta = 17.5 \text{ mm}$$



$$\phi_{AB} = \phi_{BA} + 180^\circ = 200^\circ 30' 10''$$

[折角]

$$= 185^\circ 40' 06'' + 215^\circ 10' 44'' + 295^\circ 40' 12'' + 175^\circ 40' 36''$$

$$= 872^\circ 11' 38''$$

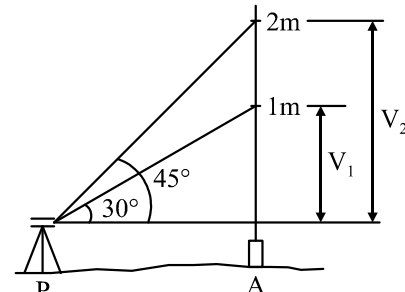
$$\text{角度閉合差} = \phi_{AB} + [\text{折角}] - 180^\circ \times 4 - \phi_{CD} = +3' 20''$$

12. (A) 在兩已知三角點間佈置一附和導線，該導線之橫距和理論值應等於兩三角點之橫距差

(C) 導線選點時應選擇相鄰兩點必須互相通視且展望良好之位置

(D) 導線測量之精度一般以導線閉合比數表示之

13.



$$\alpha_{A-1\text{m}} = 90^\circ - 60^\circ = 30^\circ$$

$$\alpha_{A-2\text{m}} = 90^\circ - 45^\circ = 45^\circ$$

$$V_1 = \overline{PA} \times \tan 30^\circ$$

$$V_2 = \overline{PA} \times \tan 45^\circ$$

$$\therefore \overline{PA} = \frac{V_2 - V_1}{\tan 45^\circ - \tan 30^\circ} = 2.366 \text{ m}$$

$$H_A = H_p + \overline{PA} \times \tan 45^\circ + 1.230 - 2$$

$$= 25 + 2.366 \times 1 + 1.230 - 2 = 26.596 \text{ m}$$

15.  $T = R \times \tan \theta \quad \therefore \theta = 60^\circ$

$$\widehat{BC EC} = R \times 2\theta \times \frac{\pi}{180^\circ}$$

$$\therefore \widehat{BC EC} = 100 \times 120^\circ \times \frac{\pi}{180^\circ} = 209.333 \text{ m}$$

$$EC \text{ 樁里程} = I.P \text{ 樁里程} - T + \widehat{BC EC}$$

$$= 2 \text{ k} + 360.480 - 173.2 + 209.333$$

$$= 2 \text{ k} + 396.613 \text{ m}$$

16.  $H(x) = \frac{g_2 - g_1}{2L} x^2 + g_1 x + H_{BVC}$

$$H(x) = \frac{-4\% - 2\%}{2 \times 100} x^2 + 2\%x + 105.2$$

$$x = (12 \text{ k} + 140) - (12 \text{ k} + 100) = 40 \text{ m}$$

代入上式

$$\text{得 } H(40) = \frac{-4\% - 2\%}{2 \times 100} (40)^2 + 2\%(40) + 105.2$$

$$= 105.520 \text{ m}$$

17.  $H_1 = \frac{49.5 + 49.3 + 48.8 + 49.2}{4} = 49.2 \text{ m}$

$$H_2 = \frac{49.3 + 49.2 + 49.1}{3} = 49.2 \text{ m}$$

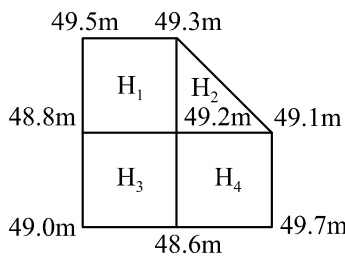
$$H_3 = \frac{48.8 + 49.2 + 49.0 + 48.6}{4} = 48.9 \text{ m}$$

$$H_4 = \frac{49.2 + 49.1 + 48.6 + 49.7}{4} = 49.15 \text{ m}$$

$$V_{\pm \text{方}} = 100 \times 49.2 + 50 \times 49.2 + 100 \times 48.9 + 100 \times 49.15$$

$$= 17185 \text{ m}^3$$

$$\text{挖填平衡高程} = \frac{17185}{350} = 49.1 \text{ m}$$

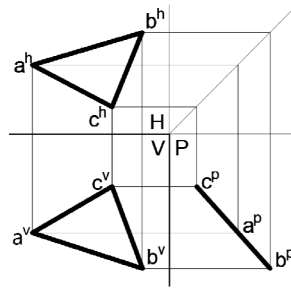


18.  $H_{\text{樑底}} = 25.800 + 1.782 - (-1.318) = 28.900 \text{ m}$

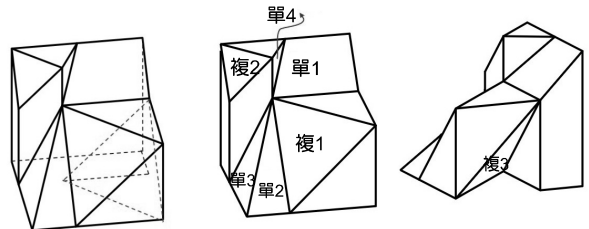
$$H_{\text{天花板施作線}} = 28.900 - 0.5 = 28.400 \text{ m}$$

### 第二部分：製圖實習

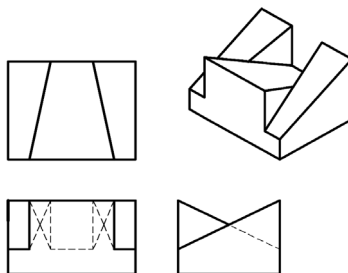
21. (C) 手寫字體規格共有 11 種，其字體之高寬比約為 3 : 2
22. (B) 使用鉛筆畫線時，鉛筆沿畫線方向與圖面成  $60^\circ$  交角
23. (A) 截斷線為(中)實線
24. 漸開線為一種平面螺旋曲線，可視為一條繩索，緊繞著一個幾何圖形(如三角形、多邊形、圓)之周圍，當轉開時，繩索端點所形成之軌跡
25. 三角形平面 ABC 之直立投影(V)，水平投影(H)及側投影(P)圖



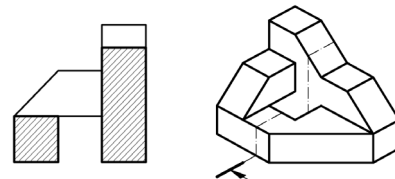
26.



27.



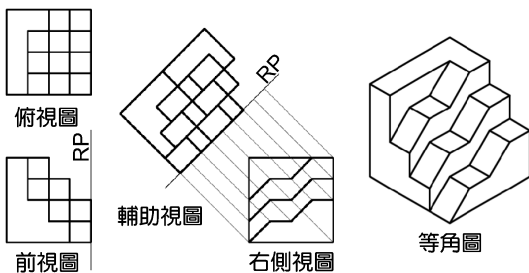
28. (B)



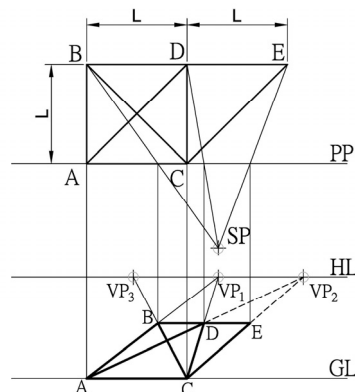
29. (D) 半剖面均應用於對稱的物體，以中心線為分界線，可將物體外形及剖面同時顯示於視圖上

30. (B) 直徑符號 $\Phi$ 寫在直徑數字前面

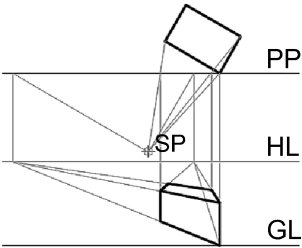
31.



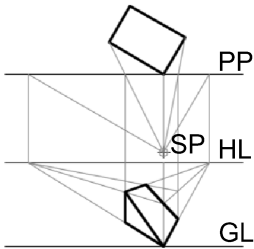
32. 若直線傾斜於投影面，則平行線會朝向共同的消失點聚合



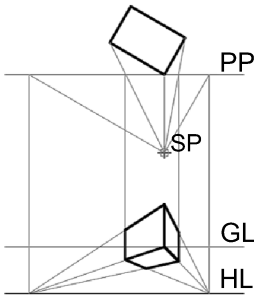
33. (A) 二點透視(成角透視圖)



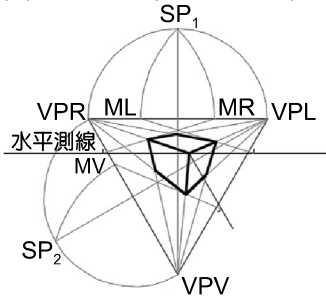
(B) 二點透視(成角透視圖)



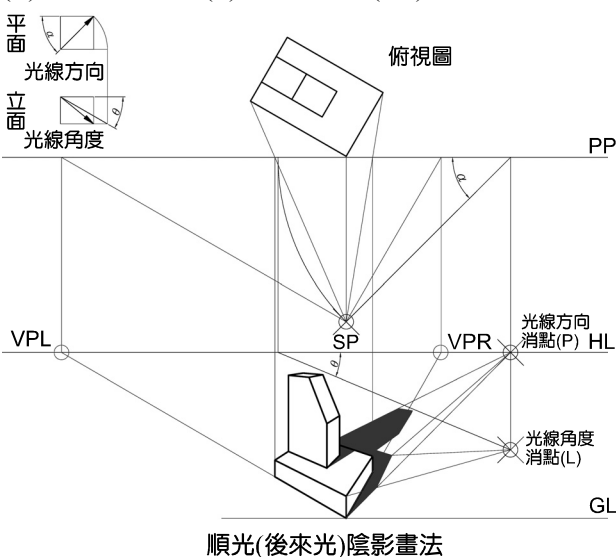
(C) 二點透視(成角透視圖)



(D) 三點透視(傾斜透視圖)



34. (C) 光線角度消點(L)位於視平線(HL)下方



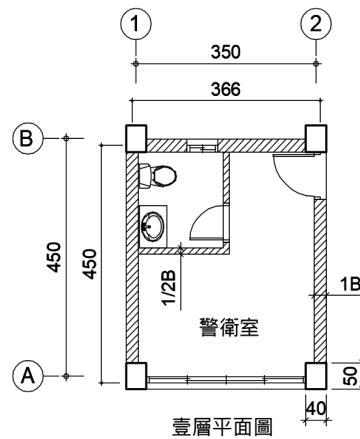
35.

①消防栓箱 FHC	③火警受信總機
④偵煙型火警探測器 S	⑥定溫型火警探測器
⑦報警標示燈 L	⑨手動報警機 P

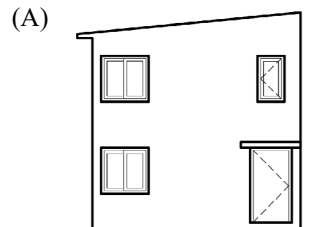
36. (A) 圖號及圖樣編號準則：P 代表給水、排水及衛生設備圖

37. 建築技術規則「建築面積」定義：建築物外牆中心線或其代替柱中心線以內之最大水平投影面積  
該圖尺度標註為柱心尺度，該題需計算外牆中心線之最大投影面積為建築面積

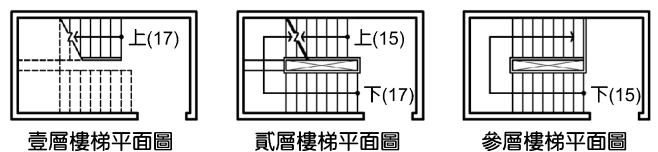
$$\text{計算：} 4.5 \times [3.5 + (0.20 - 0.12) \times 2] = 16.47 \text{ m}^2$$



38. 單開門及單開窗立面開啓方向



39. 以下圖示為各樓層樓梯階數



(C) 貳層平面通往參層平面的樓梯階數共 15 階

40. (D) 建築剖面圖需載明建築物高度、簷高、層高、屋頂突出物高度