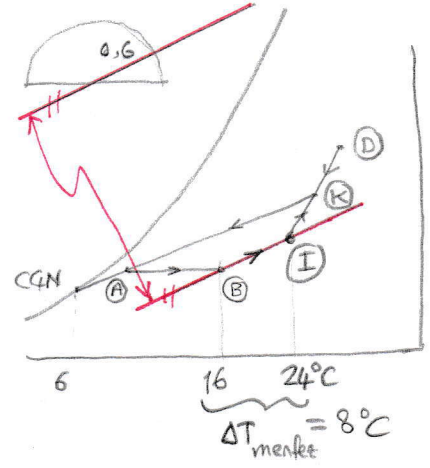
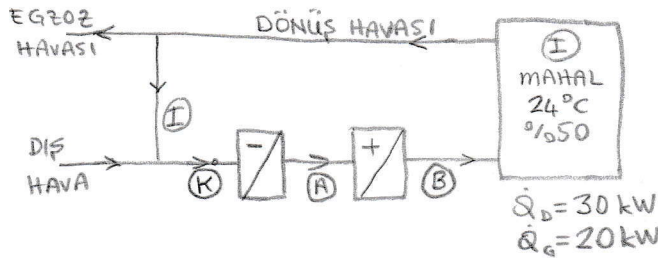


2)



a) $\dot{m}_h = ?$ $\dot{Q}_T = \dot{m}_h (h_I - h_B)$

$$\dot{m}_h = \frac{\dot{Q}_T}{(h_I - h_B)} = \frac{\dot{Q}_D + \dot{Q}_G}{(h_I - h_B)} = \frac{30 + 20}{(47.5 - 34.5)} = 3.846 \text{ kg/s}$$

$$\dot{m}_h = 3.846 \text{ kg/s}$$

$$\dot{V}_h = \frac{\dot{m}_h}{\rho} = \frac{3.846}{1.2} = 3.205 \frac{\text{m}^3}{\text{s}} = 11538 \frac{\text{m}^3}{\text{h}}$$

$$\dot{V}_h = 11538 \text{ m}^3/\text{h}$$

b) $CBYO = \frac{T_A - T_{CGN}}{T_K - T_{CGN}} = ?$

Psikrometrik diyagramdan $T_A \approx 11^\circ\text{C}$ okunur.

$$CBYO = \frac{11 - 6}{30 - 6} = \frac{5}{24} = 0.2083$$

$$CBYO \approx 0.21, \%21$$

c) $\dot{Q}_{soğ} = ?$

$$\dot{Q}_{soğ} = \dot{m}_h (h_K - h_A) = 3.846 (61 - 29) = 123.072 \text{ kW}$$

$$\dot{Q}_{soğ} \approx 123 \text{ kW}$$

d) $\dot{m}_w = ?$

$$\dot{m}_w = \dot{m}_h (w_K - w_A) = 3.846 (12 - 7) \times 10^{-3} = 0.01923 \text{ kg/s}$$

$$\dot{m}_w = 0.01923 \text{ kg/s} = 69.228 \text{ kg/h}$$

e) $\dot{Q}_{ısı} = ?$

$$\dot{Q}_{ısı} = \dot{m}_h (h_B - h_A) = 3.846 (34.5 - 29) = 21.153 \text{ kW}$$

$$\dot{Q}_{ısı} \approx 21.2 \text{ kW}$$

11 Haziran 2015

MAK 440 İklimlendirme ve Soğutma
Bütünleme - Cevap 2 -

37

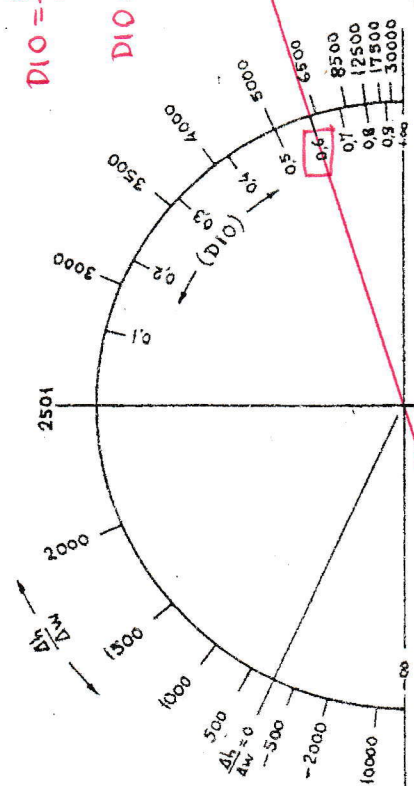
Şadi TAMER, "Klima ve Havalandırma"

Psikrometrik Diyagram
(Basınç 101,3 kPa = 1013 m bar = 760 mm Hg)

KLİMA VE HAVALANDIRMA

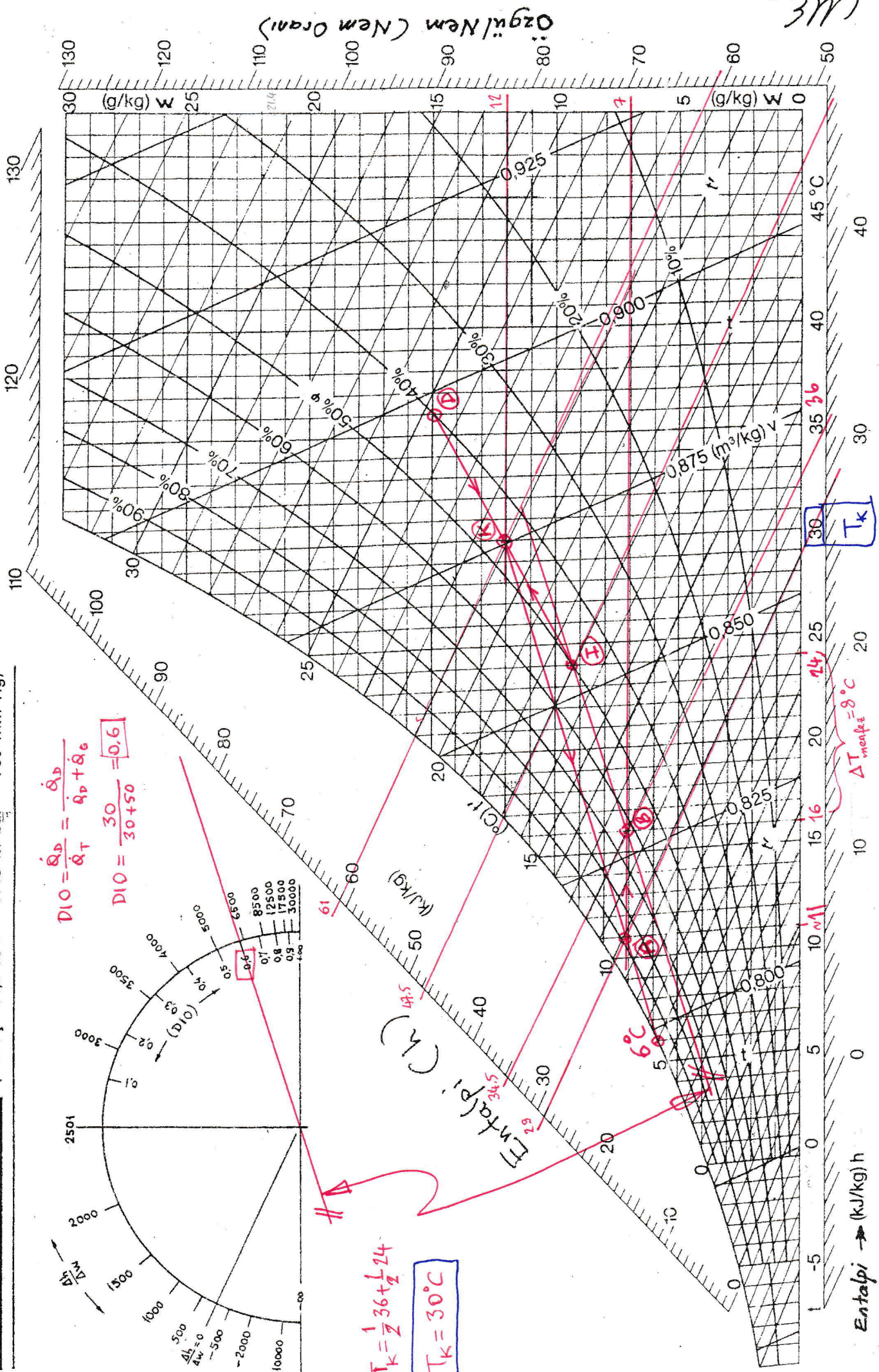
$$DIO = \frac{\dot{Q}_D}{\dot{Q}_T} = \frac{\dot{Q}_D}{\dot{Q}_D + \dot{Q}_G}$$

$$DIO = \frac{30}{30+50} = 0,6$$



$$T_k = \frac{1}{2} 36 + \frac{1}{2} 24$$

$$T_k = 30^\circ\text{C}$$



Entalpi → (kJ/kg) h

3) Isı kazancı hesabı:

* Camlardan güneş ışınımı ile gelen ısı:

$$\dot{Q}_{12} = A \left(\frac{A_R}{A} \right) q_g \quad [W] \quad (6.1) \text{ (Sayfa 191)}$$

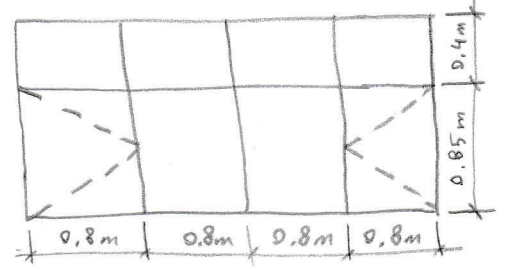
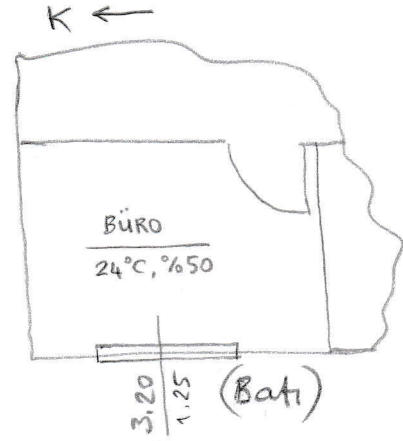
$$\left(\frac{A_R}{A} \right) = 516 \text{ W/m}^2 \quad \text{Temmuz, saat 16, Batı cephesi için Tablo 6.5'ten okunur. (Sayfa 206)}$$

$$q_g = 1 \quad (\text{Bilinmeyen durumlarda en olumsuz durum esas alınır.})$$

$$A = 3.2 \times 1.25 = 4 \text{ m}^2$$

$$\dot{Q}_{12} = 4 \times 516 \times 1 = 2016 \text{ W}$$

$$\dot{Q}_{12} = 2016 \text{ W}$$



* Pencereden transmisyon ısı:

$$\dot{Q}_{1K} = KA(T_d - T_i) \quad [W] \quad (6.2) \text{ (Sayfa 191)}$$

$$\dot{Q}_{1K} = 4.0 \times 4 \times (35 - 24) = 176 \text{ W}$$

$$\dot{Q}_{1K} = 176 \text{ W}$$

Açılan kısımların çevre uzunluğu:

$$L = 2 [2(0.8 + 0.85)] = 6.6 \text{ m}$$

* Aydınlatmadan gelen ısı: $\dot{Q}_{S,ayd.} = k_1 k_2 Q_{TA} \quad [W] \quad (6.8) \text{ (Sayfa 193)}$

Bilgi verilmediğinden $k_1 = 1$ (Kullanma faktörü.)

$k_2 = 1.2$ (Floresan için armatür faktörü) (Sayfa 193)

$$Q_{TA} = 40 \times 12 = 480 \text{ W}$$

$$\dot{Q}_{S,ayd.} = 1 \times 1.2 \times 480 = 576 \text{ W}$$

$$\dot{Q}_{S,ayd.} = 576 \text{ W}$$

* İnsanlardan gelen ısılar:

$$Q_{4d} = n \cdot Q_{4d,insan} \quad (6.6) \text{ (Sayfa 192)}$$

$$Q_{4g} = n \cdot Q_{4g,insan} \quad (6.7)$$

$$Q_{4d} = 6 \times 72 = 432 \text{ W}$$

$$Q_{4g} = 6 \times 59 = 354 \text{ W}$$

$$Q_{4d} = 432 \text{ W}$$

$$Q_{4g} = 354 \text{ W}$$

24°C'lik büroda

$$Q_{4d,insan} = 72 \text{ W/kişi}$$

$$Q_{4g,insan} = 59 \text{ "}$$

* İnfiltrasyon havasıyla gelen ısılar:

$$Q_{i6d} = \beta_h V_i c_p h \frac{(T_d - T_i)}{3600} \quad (6.14) \text{ (Sayfa 195)}$$

$$Q_{i6g} = \beta_h V_i h_{sb} \frac{(w_d - w_i)}{3600} \quad (6.15)$$

$$Q_{i6d} = 1.2 \times 12.474 \times 1.005 \frac{(35 - 24)}{3600} = 0.04597 \text{ kW}$$

$$Q_{i6g} = 1.2 \times 12.474 \times 2501 \frac{(12 - 7)10^3}{3600} = 0.05199 \text{ kW}$$

$$V_i = \Sigma(aL) RH z_i$$

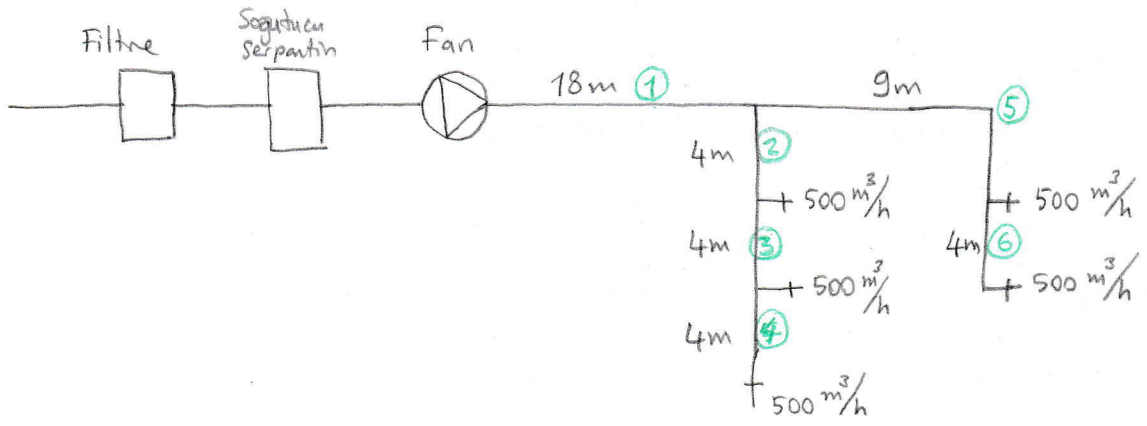
$$a = 1.5 \frac{\text{m}^3}{\text{mh}} \quad (\text{Tablo 6.21, s: 221})$$

$$V_i = 1.5 \times 6.6 \times 0.9 \times 1.4 \times 1.0 = 12.474 \text{ m}^3/\text{h}$$

$$Q_{i6d} \approx 46 \text{ W}$$

$$Q_{i6g} \approx 52 \text{ W}$$

4)



KANAL EBADI HESABI						DÜZ KANAL KAYIPLARI			YEREL KAYIPLAR		
No	Debi m³/h	Hız m/s	Alan m²	Ebat m x m	Esd. Çap cm	R mmSS m	L m	L x R mmSS	ε	Z mmSS	Cinsi
a	b	c	d	e	f	g	h	i	j	k	l
1	2500	6.1			38	0.1	18	1.8	1.3	2.96	Ayrılma (No.2)
2	1500	5.5			32	0.1	4	0.4			
3	1000	4.8			27	0.1	4	0.4			
4	500	4.1			21	0.1	4	0.4			
								3.0	+	2.96	= 5.96 mmSS
										Fitre	3
										Sogutucu Serpantin	3
										menfez	3
										Fan Statik Basıncı =	14.96

$$Z = \sum \frac{V^2}{2g} \frac{\rho_A}{\rho_w} \times 1000 = 1.3 \frac{6.1^2}{2 \times 9.81} \frac{1.2}{1000} \times 1000 = 2.96$$

1	2500	6.1			38	0.1	18	1.8			
5	1000	4.8			27	0.1	9	0.9	0.9	2.05	Dirsek
6	500	4.1			21	0.1	4	0.4			
								3.1	+	2.05	= 5.15
										Fitre	3
										Sogutucu Serpantin	3
										menfez	3
										Fan Statik Basıncı =	14.15 mmSS

1-2-3-4 Hattı kritik dervedir.