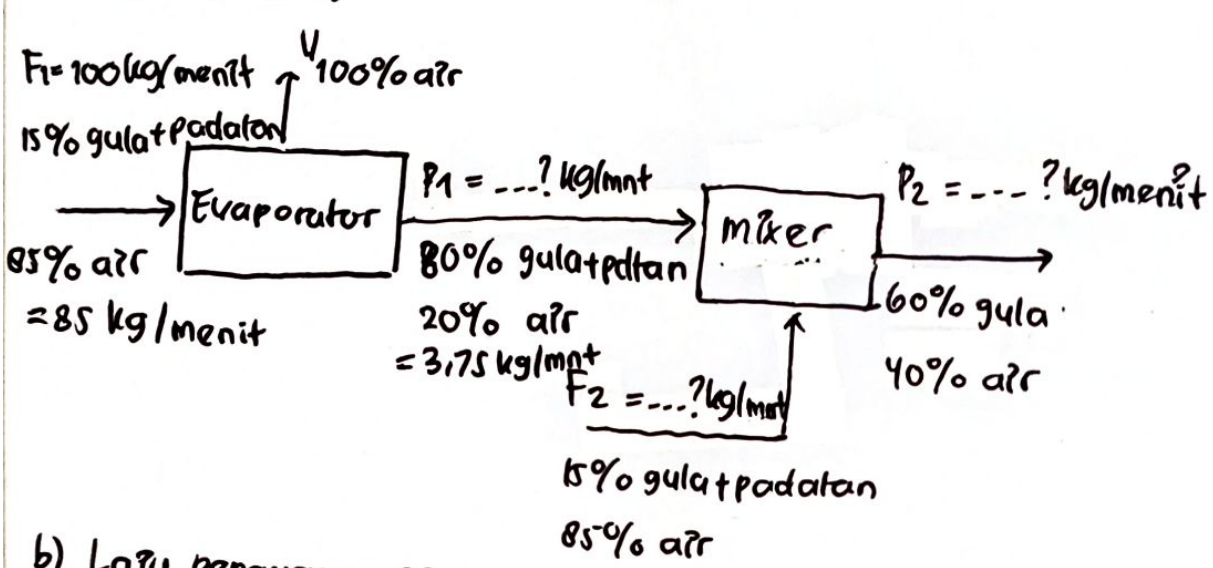
a) Gambarkan skema proses tersebut lengkap dgn data yg tersedia!



b) Laju penguapan air di evaporator

* NM total di Evaporator

$F_1 = V + P_1$

$100 \text{ kg/mnt} = V + P_1$

* NM total gula + padatan di evaporator

$F_1 \cdot X_{\text{gula+padatan}} = V(0) + P_1 (X_{\text{gula+padatan}})$

$100 (0,15) = P_1 (0,80)$

$P_1 = \frac{15}{0,80} \rightarrow P_1 = 18,75 \text{ kg/menit}$

* Lanj. NM total di Evaporator

$100 \text{ kg/menit} = V + P_1$

$100 = V + 18,75 \text{ kg/menit} \rightarrow V = (100 - 18,75) \text{ kg/menit}$

$V = 81,25 \text{ kg/menit} \rightarrow$ laju penguapan air di evaporator

c) Berapa kg/menit jus segar yg harus ditambahkan pada mixer?

* NM total air di mixer

$P_1 \cdot X_{air} + F_2 \cdot X_{air} = P_2 \cdot X_{air}$

$18,75 (0,2) + F_2 (0,85) = P_2 (0,4)$

$3,75 + 0,85 F_2 = 0,4 P_2$

$0,4 P_2 - 0,85 F_2 = 3,75 \text{ ---} (1)$

* NM total di Mixer

$P_1 + F_2 = P_2$

$18,75 + F_2 = P_2$

$P_2 - F_2 = 18,75 \text{ ---} (2)$

* Eliminasi persamaan (1) dan (2)

$P_2 - F_2 = 18{,}75$ ---- (2) | x 0,85 | $0{,}85P_2 - 0{,}85F_2 = 15{,}94$

$0{,}4P_2 - 0{,}35F_2 = 3{,}75$ ---- (1) | x 1 | $0{,}4P_2 - 0{,}35F_2 = 3{,}75$

$0{,}45P_2 = 12{,}19$

$P_2 = \frac{12{,}19}{0{,}45}$

$P_2 = 27{,}08$ kg/mnt

* $P_2 - F_2 = 18{,}75$ --- (2)

$27{,}08 - F_2 = 18{,}75$

$F_2 = 27{,}08 - 18{,}75$

$F_2 = 8{,}33$ kg/menit → jus segar yg harus ditambahkan pd mixer

d) Berapa laju alir umpan jus buah segar seluruhnya ?

↳ $F_1 + F_2$

= 100 kg/menit + 8,33 kg/menit

= 108,33 kg/menit

Tabel :

Komponen	F_1 = 100 kg/mnt		P_1 = 18,75 kg/mnt		F_2 = 8,33 kg/mnt		P_2 = 27,08 kg/mnt	
	Laju (kg/mnt)	Fraksi mol	Laju (kg/mnt)	Fraksi mol	Laju (kg/mnt)	Fraksi mol	Laju (kg/mnt)	Fraksi mol
Gula + padatan	15	0,15	15	0,80	1,25	0,15	16,25	0,60
Air (H_2O)	85	0,85	3,75	0,20	7,08	0,85	10,83	0,40

Komponen	V = 81,25 kg/mnt	
	Laju (kg/mnt)	Fraksi mol
Gula + padatan	0	0
Air (H_2O)	81,25	1