Problem 2.19, Gupta

Pan evaporation problem

Pan Evap = 15 mm

Air Temp = 23 C

Max. Reservoir (water) Temp = 18 C

Min. Reservoir (water) Temp = 15 C

Max Pan (water) Temp = 24 C

Min Pan (water) Temp = 18 C

Rel. Humidity = 47%

K (pan coeff) = 0.7

In [2]:
```
import quantities as un
K=0.7
E_pan=15*un.mm
```

Simple Method

In [3]:
```
E_reservoir = K*E_pan
print E_reservoir
```

```
10.5 mm
```

Refined Method

Saturated vapor pressure tabulated in Appendix C

Need to use max. temps

In [4]:
```
K_prime=1.5
e_15C = 17.38*un.g*un.cm**(-2)
e_20C = 23.83*un.g*un.cm**(-2)
e_25C = 32.30*un.g*un.cm**(-2)

e_18C = (18-15.)/(20-15.) * (e_20C-e_15C) + e_15C
print e_18C
```

```
21.25 g/cm**2
```

In [5]:
```
e_24C=(24-20.)/(25-20.) * (e_25C-e_20C) + e_20C
print e_24C
```

```
30.606 g/cm**2
```

In [9]:
```
e_23C=(23-20.)/(25-20.) * (e_25C-e_20C) + e_20C
RH=.47
e_z=e_23C*RH
print e_23C,',',e_z
```

```
28.912 g/cm**2 , 13.58864 g/cm**2
```

$E_{res} = K^' \cdot E_{pan} \frac{e_{res}-e_z}{e_{pan}-e_z}$

In [12]:
```
E_res=K_prime * E_pan * (e_18C-e_z)/(e_24C-e_z)
print E_res
```

```
10.1296910919 mm
```