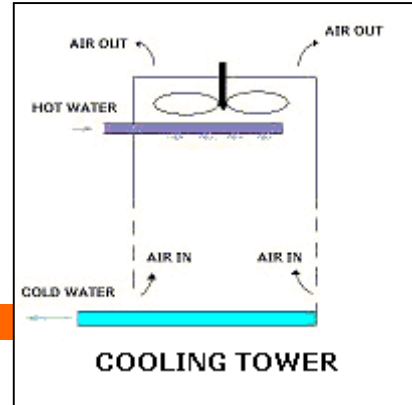


COOLING TOWER

| | |
|---|---------------------|
| Water inlet mass flow rate | 5.5 kg/s |
| Water inlet temperature | 44 C |
| Induced air flow rate | 9 m ³ /s |
| Power absorbed by air (power used by fan) | 4.75 kW |
| Inlet air temperature | 18 C |
| Inlet air relative humidity | 60 % |
| Outlet air temperature | 26 C |
| Outlet air relative humidity | 100 % |
| Air pressure thru tower | 1.013 bar |



Calculate
 mass flow rate of make-up water
 Final temperature of water leaving the cooling tower

At inlet

| | |
|--|-------------|
| Pg | 0.021 bar |
| partial pressure of water | 0.012 bar |
| Partial pressure of other gases in inlet air | 1.001 bar |
| Mass flow rate of air (dry) | 10.783 kg/s |
| Mass flow rate of water in the air | 0.083 kg/s |
| moisture content | 0.008 |

At Exit

| | |
|------------------------------------|------------|
| Pg | 0.034 bar |
| specific humidity/moisture content | 0.021 |
| Mass flow rate of water in the air | 0.230 kg/s |
| Make-up water req. | 0.147 kg/s |
| Water leaving the cooling tower | 5.353 kg/s |

| Applying steady-flow condition | m[kg/s] | h[kJ/kg] | m*h[kJ/s] |
|--------------------------------|---------|----------|-----------|
| Inlet air | 10.866 | 37.51 | 407.55 |
| Outlet air | 11.013 | 80.66 | 888.28 |
| Inlet water | 5.500 | 184.25 | 1013.38 |
| Outlet water | 5.353 | 100.40 | 537.40 |

| | |
|--------------------------|--------|
| Outlet water temperature | 23.9 C |
|--------------------------|--------|