

**Assignment – I**  
**MEDX 38 – Solar Engineering**

1. Explain the principle involved in the measurement of solar radiation.
2. Determine the day length and hour angle at sun rise for a location (Longitude  $70^{\circ}$  E and Latitude  $32^{\circ}$  North) on April 27.
3. What are the various types of evacuated tube solar collector? Explain them with neat sketches.
4. Calculate the collector efficiency on June 22 for a flat plate collector located at Pune (Latitude =  $19^{\circ}$  North) and tilted at angle of  $35^{\circ}$ . The solar radiation is  $600 \text{ W/m}^2$ . Overall heat transfer coefficient =  $6 \text{ W/m}^2 \text{ K}$ . Fluid to tube heat transfer coefficient is  $1000 \text{ W/m}^2 \text{ K}$  with Aluminium fins and tubes. The centre distance between the tubes = 15 cm, fin thickness = 0.05 cm. Tube outside diameter = 1.5 cm, cover transmittance for solar radiation is 0.9 and independent of direction. The solar absorptance of absorbing plate is 0.95. Collector width = 1 m, collector length = 3 m. Water flow rate = 75 kg/hr. Water inlet temperature is constant and is equal to  $54^{\circ}\text{C}$ . Ambient temperature =  $27^{\circ}$ . Reflectance of the glass cover = 0.18 and hour angle =  $22^{\circ}$ .