Physics Class Notes

Watt-Hour Meter

Watt-hour meter is a device that is used to measure electrical energy. Electrical energy is measured using the unit kilowatt hour. This is also known as a unit.

1 unit electrical energy= 1 kWh

The commercial unit of electrical energy is *kilowatt hour (kWh).* A device of power 1000 W (1 kW) when used for one hour (1 h), consumes one unit of electrical energy (1 kWh).

Energy in kilowatt hour = (Power in watt x time in hour)/1000.

$1 \text{ kWh} = 3.6 \times 10^6 \text{ J}$

Problem

1.**A grinder of power 750 W works for 2 hours. Calculate the energy consumed?**

Ans: Energy in kilowatt hour = (Power in watt x time in hour)/1000.

= (750×2)/1000= 1500/1000= 1.5 kWh = 1.5 unit.

2. **In a house, 5 CF lamps each of 20 W, works for 4 hours, 4 fans each of 60 W work for 5 hours and a TV of 100 W works for 4 hours in a day. What will be the daily consumption shown by the watt hour meter?**

Ans: Energy consumed by CFL

Energy in kilowatt hour = (Power in watt x time in hour)/1000.

= (5×20×4)/1000= 400/1000 = 0.4 unit.

Energy consumed by Fans

Energy in kilowatt hour = (Power in watt x time in hour)/1000.

=(4×60×5)/1000= 1200/1000= 1.2 unit.

Energy consumed by TV

Energy in kilowatt hour = (Power in watt x time in hour)/1000.

= (100×4)/1000= 400/1000= 0.4 unit.

Daily consumption= 0.4 + 1.2 + 0.4 = 2 unit.