EE256: POWER AND ENERGY

POWER & ENERGY, MEASUREMENT.

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① What are the safety procedures you should follow when connecting a rheostat to the circuit?

- First ensure the power supply is turned off and disconnected before making any connection.
- Adjust the rheostat to maximum resistance before turning on the power.
- Avoid touching live wires.
- Check all the connections before powering up the circuit.

② Comment on the accuracy when taking the number of rotations in the energy meter.

The accuracy of measuring the number of rotations of an energy meter disc is primarily affected by human error. Specially, reaction times, parallax error, counting error may affect to the accuracy of reading. To improve accuracy we should view the disk from a fixed position directly perpendicular to the meter's face and count the rotations over a longer time interval to minimize the relative effect of starting and stopping errors.

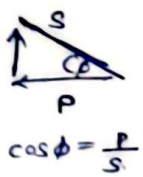
③ How to find active power, reactive power, apparent power & power factor using voltmeter, ammeter and single wattmeter reading V, I & W?

Active power (P) = wattmeter reading = W (in watts)

Apparent power (S) = VI (in VA)

Reactive power (ϕ) = $\sqrt{(VI)^2 - W^2}$ (in VAR)

Power factor ($\cos\phi$) = $\frac{P}{S} = \frac{W}{VI}$



$\cos\phi = \frac{P}{S}$

④ How to find the energy acquired by the circuit using the energy meter readings, number of rotations (N) & meter constant (K)?

$K \rightarrow$ rev / kWh.

$$E = \frac{N}{K}$$

$E \rightarrow$ energy consumed (kWh)

$N \rightarrow$ Number of rotations

$K \rightarrow$ meter constant (rev / kWh).

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