Python For Electrical Workout - I

presented by "Pi Research Tech"

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1) Loads are Fan = 150 W, pc =150 W, LED = 2 x 20 W. Supply Voltage = 230 V. Find the minimum current requirement of inverter?

Hint:

Imin= TotalPower (P)/Voltage

In [1]:
```
print('Minimum current requirement for an inverter')
fan = 150
pc = 150
LED = 40
voltage = 230
total = fan+pc+LED
minimumI = total / voltage
print('minimum current requirement of interval:', minimumI)
```

```
Minimum current requirement for an inverter
minimum current requirement of interval: 1.4782608695652173
```

2) Compute motor Efficiency (All units in SI) Motor torque= 100 Angular speed = 0.8 input Power (Pin) = 100

Hint:

Pout= torque * Angular Speed

Efficiency = Pout/Pin

In [2]:
```
torque = 100
angularspeed  = 0.8
Pin = 100
Pout = torque*angularspeed
Efficiency = Pout/Pin
print('The efficiency is:', Efficiency)
```

```
The efficiency is: 0.8
```

3)Two induction motors names like ‘A’, ‘B’. That copper coil has Resistance resA= 30 Ω & resB =400 Ω . Both units have same current values I = 10A. Compute power loss. Which one has high heat?

Hint:

Power loss= I2R

Heat ∞ Powerloss

In [3]:
```
A = 30
B = 400
I = 10
powerloss1 = (I**2) * A
print(powerloss1)
powerloss2 = (I**2) * B
print(powerloss2)
```

```
3000
40000
```

4)True Power =120 W Apparent Power =170 VA Find Power-factor theta value in degree?

Hint:

PowerFactor (Cos (θ)) = True power/ Apparent Power

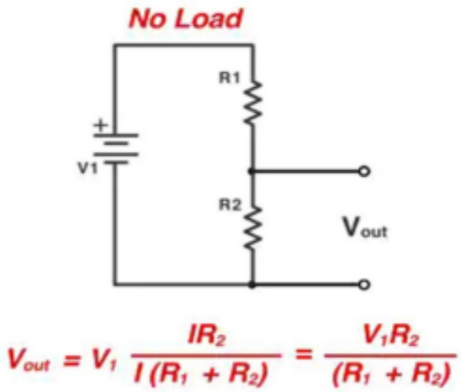
θ = cos-1 (value) # radians

θ = cos-1 (value) * 180/pi #degree

In [4]:
```
import math
truepower = 120
Apparent = 170
value = truepower/Apparent
print('result=',math.acos(value), 'in radians')
degrees = math.acos(value) * (180 / 3.14)
print('result=', degrees,'in degrees')
```

```
result= 0.787128270656128 in radians
result= 45.12200277646593 in degrees
```

5) Find R_1?



$$V_{out} = V_1 \frac{IR_2}{I(R_1 + R_2)} = \frac{V_1 R_2}{(R_1 + R_2)}$$

R2= 1 K

Find R1 when

V1 =9 V

Vout= 5V

Find R1 when

V1 =9 V

Vout= 1V

Question 5 Hint:

R1 = (V1*R2)/Vout – R2

In [5]:

```
V1 = [9.0, 5.0]
Vout = 1.0
R2 = 1e3
R1max = ((V1[0]*R2)/Vout) - R2
R1min = ((V1[1]*R2)/Vout) - R2
print(R1min)
print(R1max)
```

```
4000.0
8000.0
```