1). Solar panel having Specifications

1, maximum voltage rating = 100V

Current = 20A.

ADC voltage = 3.3V

Calculate total earnings possible from generated energy?

Assume RS 6 paid per unit (kwh)

Given

Solar panel maximum voltage $(V_{max}) = 100V$.

Solar panel maximum current $(I_{max}) = 20A$.

micro Controller ADC voltage $(V_{ADC}) = 3.3V$

Energy rate = 6 RS per Unit (kwh)

The power output of solar panel $P_{max} = V_{max} \times I_{max}$

$P_{max} = 100V \times 20A = 2000W = 2KW$

$P_{max} = 2KW$

Estimate energy generation

Assuming Solar panel operates 5 hours daily

daily energy generated is E_{daily} = $\frac{P_{max} \times time}{}$

$$E_{daily} = 2 kW \times 5 hours$$

$$E_{daily} = 10 kWh/day.$$

Earnings

Earnings per day = $E_{daily} \times$ rate per unit

= 10 kWh $\times$ 6 Rs/kWh

$$\boxed{Earnings/day = 60 Rs/day}$$

Earning/month = 60 Rs/day $\times$ 30

$$\boxed{= 1800 Rs/month}$$

for (365) days

Earning/year = 60 Rs/day $\times$ 365

$$\boxed{= 21,900 Rs/year}$$

ADC Scaling equations

voltage :- $V_{measured} = V_{adc} \times$ scaling factor.

$$\text{Scaling factor} = \frac{\text{Input range of sensor}}{\text{ADC range}}$$

$$V_{measured} = V_{adc} \times \text{Scaling factor}$$

given : Sensor output $0-3.3V$ for $0-100V$

$$V_{measured} = 3.3 \times \frac{100}{3.3} = \underline{100V}$$

Current Scaling : $I_{measured} = I_{adc} \times \frac{20}{3.3}$

Sensor outputs $0-3.3V$ for $0-20A$

$$I_{measured} = 3.3 \times \frac{20}{3.3} = \underline{20A}$$

$V_{measured} = 100V.$

$I_{measured} = 20A.$

Power $P = 2 kW$

Energy $E_{daily} = 10 kWh$

Earnings Daily = $RS\ 60.$

monthly $= 1800\ RS.$