



Task 2.3

starting with LED

$$V = 12V$$

$$R = 3.3 \Omega$$

$$I = \frac{V}{R} = \frac{12}{3.3} = 3.64 A$$

$$\text{power} = \text{Volt} \times \text{Current}$$

$$= 12 \times 3.64 = 43.68 W$$

$$\text{Energy} = \text{power} \times \text{Time} = 43.68 \times 5 = 218.4 Wh$$

Finding the Number of batteries

I Found two approaches

First using C-Rate

$$\text{LED Current} = 3.64 A$$

$$\text{C-Rate} = \frac{I}{\text{Battery Capacity}} = I \times \text{time}$$

$$\text{Battery charge} = 5.2 Ah$$

$$C\text{-Rate} = 3.64 / 5.2 = 0.7$$

$$\text{Discharge time} = 1 / C\text{-Rate} = 1 / 0.7$$

$$\text{Discharge time} = 1.48 h$$

$$\text{Time needed} = 5 \text{ hours} \times \frac{5}{1.48} = 3.37 = 4.16$$

Energy batteries

If usage of 80% of capacity

$$5.2 \times 0.80 = 4.16$$

C-Rate = $I / \text{battery charge}$

$$3.64 / 4.16 = 0.875$$

$$\text{Discharge time} = 1 / 0.875 = 1.142$$

$$\frac{5}{1.142} = 4.37 = 5 \text{ batteries}$$