Q- A capacitor stores 135 J of energy when it is charged to 300 V

(a) What is the capacitance of the capacitor?

(b) How much charge must be transferred from one plate to the other to store this energy?

The energy stored in a capacitor is given by

$$U = \frac{1}{2}CV^2 = \frac{Q^2}{2C} = \frac{1}{2}QV$$

(a) Here U = 135 J

And V = 300 V

Thus $U = \frac{1}{2}CV^2$ gives

$$C = \frac{2U}{V^2} = \frac{2*135}{300^2} = \mathbf{3 * 10^{-3}\ F}$$

(b) The charge on the capacitor plates is given by

Q = CV = $3*10^{-3}*300$ = **0.9 C**