PQ 3a Electricity

Questions

Q1

Determine the charge that has flowed through a torch battery producing a current of 300 mA if it has been left on for 20 minutes.

Q2

The alternator of a car being driven at night with the headlights on is producing a 50 A current at an EMF of 12 V.

a How many coulombs of charge flow from the alternator each second?

b How many joules of energy does each coulomb of charge obtain?

c How many joules of energy does the alternator produce each second?

d Where does this energy go?

Q3

The potential difference across a torch bulb is found to be 2.7 V.
The current flowing through it is 0.2 A.

a How much charge flows through the torch in 1 minute?

b How much energy is lost by this charge?

Q4

- Current through a globe connected across the terminals of a 125-V outlet is 0.50 A. At what rate does the globe convert electric energy to light? (Assume 100 percent efficiency.)

Q5

- A vehicle battery causes a current of 2.0 A through a lamp and produces 12 V across it. What is the power used by the lamp?

Q6

- What is the current through a 75-W globe that is connected to a 125-V outlet?

Q7

- The current through the starter motor of a vehicle is 210 A. If the battery maintains 12 V across the motor, how much electric energy is delivered to the starter in 10 seconds?

Q8

- A torch bulb is rated at 0.90 W. If the globe drops 3.0 V, how much current goes through it?

Q9

- 100W bulb is 22 percent efficient. This means that 22 percent of the electric energy is converted to light energy.
- **a.** How many joules does the bulb convert into light each minute it is in operation?

- **b.** How many joules of thermal energy does the bulb produce each minute?

Q10

- An electric space heater draws 15.0 A from a 120-V source. It is operated, on the average, for 5 hours per day.
- How much power does the heater use?