401. Earth's radius is 6.4×10^6 m. What is Earth's capacitance if it is regarded as a conducting sphere?

402. A 0.50 pF capacitor is connected across a 1.5 V battery. How much charge can this capacitor store?

403. A 76 C charge passes through a wire's cross-sectional area in 19 s. Find the current in the wire.

404. The current in a telephone is 1.4 A. How long does 98 C of charge take to pass a point in the wire?

405. What is a television's total resistance if it is plugged into a 120 V outlet and carries 0.75 A of current?

406. A motor with a resistance of 12.2 Ω is plugged into a 120.0 V outlet. What is the current in the motor?

407. The potential difference across a motor with a 0.30 Ω resistance is 720 V. How much power is used?

408. What is a microwave oven's resistance if it uses 1750 W of power at a voltage of 120.0 V?

409. A 64 nC charge moves 0.95 m with an electrical potential energy change of -3.88×10^{-5} J. What is the electric field strength?

410. A −14 nC charge travels through a 156 N/C electric field with a change of 2.1×10^{-6} J in the electrical potential energy. How far does the charge travel?

411. A 5.0×10^{-5} F polyester capacitor stores 6.0×10^{-4} C. Find the potential difference across the capacitor.

412. Some ceramic capacitors can store 3×10^{-2} C with a potential difference of 30 kV across them. What is the capacitance of such a capacitor?

413. The area of the plates in a 4550 pF parallel-plate capacitor is 6.4×10^{-3} m^2. Find the plate separation.

414. A television receiver contains a 14 μF capacitor charged across a potential difference of 1.5×10^4 V. How much charge does this capacitor store?

415. A photocopier uses 9.3 A in 15 s. How much charge passes a point in the copier's circuit in this time?

416. A 114 μC charge passes through a gold wire's cross-sectional area in 0.36 s. What is the current?

417. If the current in a blender is 7.8 A, how long do 56 C of charge take to pass a point in the circuit?

418. A computer uses 3.0 A in 2.0 min. How much charge passes a point in the circuit in this time?

419. A battery-powered lantern has a resistance of 6.4 Ω. What potential difference is provided by the battery if the total current is 0.75 A?

420. The potential difference across an electric eel is 650 V. How much current would an electric eel deliver to a body with a resistance of 1.0×10^2 Ω?

421. If a garbage-disposal motor has a resistance of 25.0 Ω and carries a current of 4.66 A, what is the potential difference across the motor's terminals?

422. A medium-sized oscillating fan draws 545 mA of current when the potential difference across its motor is 120 V. How large is the fan's resistance?

423. A generator produces a 2.5×10^4 V potential difference across power lines that carry 20.0 A of current. How much power is generated?

424. A computer with a resistance of 91.0 Ω uses 230.0 W of power. Find the current in the computer.

425. A laser uses 6.0×10^{13} W of power. What is the potential difference across the laser's circuit if the current in the circuit is 8.0×10^6 A?

426. A blender with a 75 Ω resistance uses 350 W of power. What is the current in the blender's circuit?

Chapter 18 Circuits and Circuit Elements

427. A theater has 25 surround-sound speakers wired in series. Each speaker has a resistance of 12.0 Ω. What is the equivalent resistance?

428. In case of an emergency, a corridor on an airplane has 57 lights wired in series. Each light bulb has a resistance of 2.00 Ω. Find the equivalent resistance.

429. Four resistors with resistances of 39 Ω, 82 Ω, 12 Ω, and 42 Ω are connected in parallel across a 3.0 V potential difference. Find the equivalent resistance.

430. Four resistors with resistances of 33 Ω, 39 Ω, 47 Ω, and 68 Ω are connected in parallel across a 1.5 V potential difference. Find the equivalent resistance.

431. A 16 Ω resistor is connected in series with another resistor across a 12 V battery. The current in the circuit is 0.42 A. Find the unknown resistance.

432. A 24 Ω resistor is connected in series with another resistor across a 3.0 V battery. The current in the circuit is 62 mA. Find the unknown resistance.