CH21

2. |||| The graph in **Figure P21.2** shows the electric potential energy as a function of separation for two point charges. If one charge is +0.44 nC, what is the other charge?

Figure P21.2

4. | A 20 nC charge is moved from a point where V = 150 V to a point where V = −50 V. How much work is done by the force that moves the charge?

8. ||||| What potential difference is needed to accelerate a He^{+} ion (charge +e, mass 4 u) from rest to a speed of 1.0×10^{6} m/s?

12. || A 2.0 cm × 2.0 cm parallel-plate capacitor has a 2.0 mm spacing. The electric field strength inside the capacitor is 1.0×10^5 V/m.

A. What is the potential difference across the capacitor?

B. How much charge is on each plate?

16.

A. What is the electric potential at points A, B, and C in **Figure P21.16**?

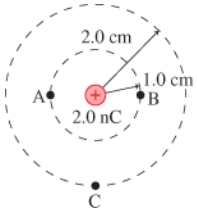

Figure P21.16

B. What is the potential energy of an electron at each of these points?

C. What are the potential differences ΔV_{AB} and ΔV_{BC}?

26. | Three electrodes, 1–3, are at-tached to a patient as shown in **Figure P21.26**. During ventricular depolarization (see **Figure 21.29**), across which pair of electrodes is the magnitude of the potential difference likely to be the smallest? Explain.

Figure P21.26

62. ||| A proton's speed as it passes point A is 50,000 m/s. It follows the trajectory shown in **Figure P21.62**. What is the proton's speed at point B?

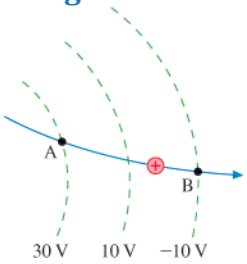

Figure P21.62

66. || A Na^+ ion moves from inside a cell, where the electric potential is −70 mV, to outside the cell, where the potential is 0 V. What is the change in the ion's electric potential energy as it moves from inside to outside the cell? Does its energy increase or decrease?