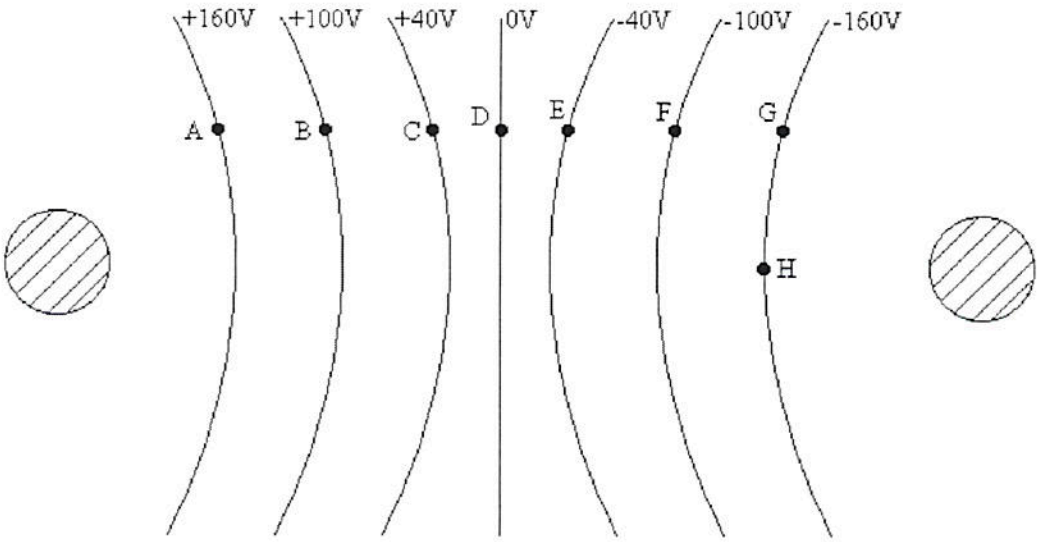
SHORT ANSWER. **Write the word or phrase that best completes each statement or answers the question**

1) The electron-volt is a unit of 1) _____

2) A negative charge, if free, tries to move 2) _____

3) Two electric charges each equal to $+Q$, are separated by a distance d. If you make a graph of the electric potential as a function of the distance along the line connecting the two charges, the point exactly midway between the two charges would 3) _____

Figure 20-2



4) The equipotential surfaces between two spherical conductors are shown in Figure 20-2, with the value of the potential marked for each line. What is the direction of the electric field at point F? 4) _____

5) A capacitor consists of a set of two parallel plates of area A separated by a distance d. This capacitor is connected to a battery that maintains a constant potential difference between the plates. If the separation between the plates is doubled, the magnitude of the charge on the plates will 5) _____

6) Which of the following will increase the capacitance between the plates of a parallel plate capacitor? 6) _____

7) A capacitor consists of a set of two parallel plates of area A separated by a distance d. This capacitor is connected to a battery and charged until its plates carry charges $+Q$ and $-Q$. If the separation between the plates is doubled, the electrical energy stored in the capacitor will 7) _____

8) An electron is carried from the positive terminal to the negative terminal of a 9 V battery How much work is required in carrying this electron? 8) _____

9) A proton falls through a potential drop of 400 V. How much is the change of potentia energy of this proton in falling through this potential drop? 9) _____

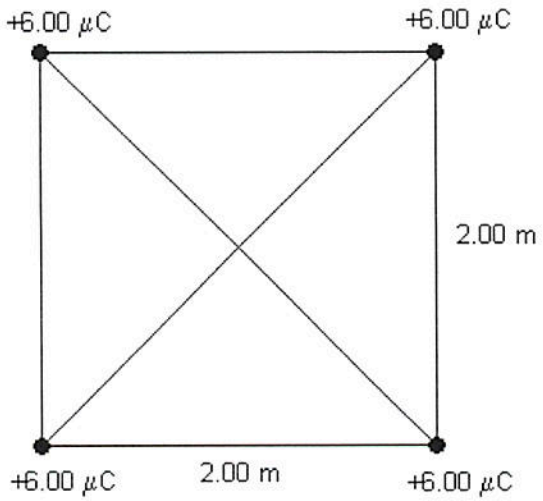
10) At a certain point in space the electric potential is 20 V. A 4.0-μC charge is brought from infinity to that point. What is the electric potential energy of this charge at that point? 10) _____

11) The potential energy at $x = 8$ m is -2000 V and at $x = 2$ m is +400 V. What is the magnitude and direction of the electric field? 11) _____

12) An electron is initially at rest. It is accelerated through a potential difference of 400 V. Wha is the kinetic energy of this electron? 12) _____

13) An electron, initially at rest is accelerated through a potential difference of 550 V. What is the speed of the electron due to this potential difference? 13) _____

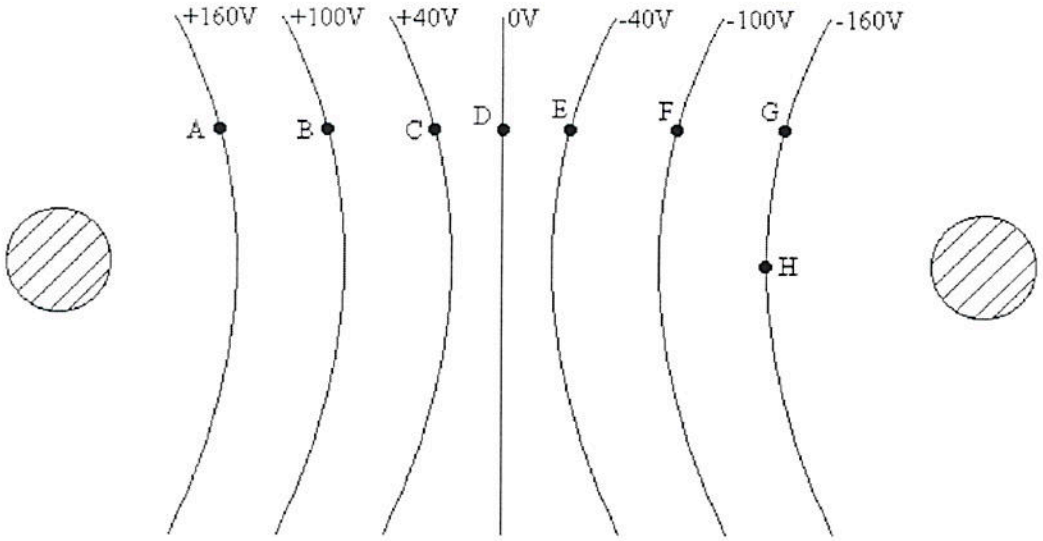
Figure 20-3



14) Four equal point charges of magnitude 6.00 μC are placed at the corners of a square 2.00 m on each side, as shown in Figure 20-3. What is the electric potential of these charges at the center of this square? 14) _____

15) A +8.00-μC charge is situated along the +y-axis at $y = 0.400$ m. What is the electric potential at the origin because of this charge? 15) _____

Figure 20-13



16) The equipotential surfaces between two spherical conductors are shown in Figure 20-13, with the value of the potential marked for each line. What is the potential difference between points G and D? 16) _____

17) The potential difference between the plates of a parallel plate capacitor with the plate separation of 6 cm is 60 V. What is the electric field between the plates of this capacitor? 17) _____

18) The magnitude of the charge on each plate of a parallel plate capacitor is 4 μC and the potential difference between the plates is 80 V. What is the capacitance of this capacitor? 18) _____

19) A 20-μF capacitor has a charge of 60 μC. How much energy is stored in this capacitor? 19) _____

20) A parallel plate capacitor has a potential difference between the plates of 80 V. If the charge on one of the plates of the capacitor is +8.0 μC, what is the electrical energy stored by this capacitor? 20) _____

21) A 4-μF capacitor has a potential drop of 20 V between its plates. The electric potential energy stored in this capacitor is: 21) _____

1) energy.
2) from low potential to high potential.
3) be a relative minimum.
4) towards G
5) be cut in half.
6) Introduce a dielectric material between the plates.
7) double.
8) 14.4×10^{-19} J
9) -6.4×10^{-16} J
10) 80 μJ
11) 400 V/m directed parallel to the $+x$-axis
12) 6.4×10^{-17} J
13) 13.9×10^{6} m/s
14) 153 kV
15) $+180 \times 10^{3}$ V
16) −160 V
17) 1000 V/m
18) 5×10^{-8} F
19) 90 μJ
20) 320×10^{-6} J
21) 800 μJ