11.9 Electric Practice

1. An electron enters a uniform electric field of strength E with a velocity v. The direction of v is not parallel to E. What is the path of the electron after entering this field? [A: Circular]
2. A negative charge Q is to be moved within an electric field E, to equidistant points from its position, as shown. [A]
3. Four identical, positive, point charges of magnitude Q are placed at the vertices of a square of side $2d$. What is the electric potential produced at the center of the square by the 4 charges?

$$\boxed{\text{C: } \frac{\sqrt{2}kQ}{d}} \tag{1}$$

4. The diagram shows the electric field and the electric equipotential surfaces between two charged parallel plates. The potential difference between the plates is 200 V. What is the work done, in nJ, by the electric field in moving a negative charge of magnitude 1 nC from the position shown to X and to Y? [A: 50 (X), 0 (Y)]
5. A positive point charge is placed above a metal plate at zero electric potential. Which diagram shows the pattern of electric field lines between the charge and the plate? [C]
6. A charge of $-3\,°\text{C}$ is moved from A to B and then back to A. The electric potential at A is $+10\,V$ and the electric potential at B is $-20\,V$. What is the work done in moving the charge from A to B and the total work done? [C]
7. An electric field acts in the space between two charged parallel plates. One plate is at zero potential and the other is at potential $+V$. The distance x is measured from Point P in the direction perpendicular to the plate. What is the dependence of the electric field strength E on x and what is the dependence of the electric potential V on x? [B]
8. Two point charges are at rest as shown. At which position is the electric field strength greatest? [B]
9. A positive charge Q is deposited on the surface of a small sphere. The dotted lines represent equipotentials. [B]
10. A negative charge moves in an electric field. Equipotential lines for the field and four possible paths of the charge are shown. Which path corresponds to the largest work done on the charge by the field? [B]