30 An electron is in an electric field of strength 5×10^4 V m^{-1}. The field is the only influence on the electron.

The mass and charge of an electron are known.

Which quantity can be calculated without any more information?

A   the force on the electron

B   the momentum of the electron

C   the kinetic energy of the electron

D   the speed of the electron

31 A relay is required to operate 800 m from its power supply. The power supply has negligible internal resistance. The relay requires 16.0 V and a current of 0.60 A to operate.

A cable connects the relay to the power supply and two of the wires in the cable are used to supply power to the relay.

The resistance of each of these wires is $0.0050\,\Omega$ per metre.

What is the minimum output e.m.f. of the power supply?

A   16.6 V   **B**   18.4 V   **C**   20.8 V   **D**   29.3 V

Space for working