30 Which charge can be carried by a charge carrier?

A 1.1×10^{-19} C

B 4.0×10^{-19} C

C 4.8×10^{-19} C

D 9.1×10^{-19} C

31 A resistor of resistance R is connected across a cell of electromotive force (e.m.f.) E and negligible internal resistance.

Which single change to the circuit would lead to the largest increase in the power dissipated in the resistor?

A doubling the value of E

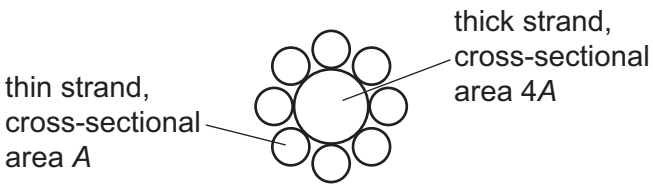
B doubling the value of R

C halving the value of E

D halving the value of R

32 An electrical cable is made up of one thick strand of copper wire that is surrounded by eight thin strands of copper wire. All nine strands of wire are connected in parallel with each other.

A cross-section of the cable is shown.



Each thin strand of wire has cross-sectional area A and length L.

The thick strand of wire has cross-sectional area $4A$ and length L.

The cable has total resistance R.

Which expression gives the resistivity of copper?

A $\frac{4A}{33RL}$ **B** $\frac{12A}{RL}$ **C** $\frac{4AR}{L}$ **D** $\frac{12AR}{L}$