

- 19 The battery of a small tablet computer is initially uncharged. It is connected to a constant 10 W power supply for 2.0 hours to charge the battery.

The efficiency of the charging process is 80%.

What is the total energy stored in the battery?

- A $1.6 \times 10^1 \text{ J}$ B $1.6 \times 10^3 \text{ J}$ C $5.8 \times 10^4 \text{ J}$ D $5.8 \times 10^6 \text{ J}$

- 20 An initially stationary firework explodes and splits into two fragments that move horizontally in opposite directions.

The total kinetic energy transferred to the fragments by the explosion is E .

One fragment has mass m and the other one has mass $2m$.

What is the speed of the fragment of mass m immediately after the explosion?

- A $\sqrt{\frac{E}{m}}$ B $\sqrt{\frac{2E}{m}}$ C $\sqrt{\frac{2E}{3m}}$ D $\sqrt{\frac{4E}{3m}}$

- 21 A spring is fixed at one end and extended by applying force F to the other end. The spring has extension x and elastic potential energy E_p . The spring constant is k .

The spring obeys Hooke's law.

Which relationship is correct for this spring?

- A $E_p \propto F$ B $E_p \propto x$ C $E_p \propto k$ D $E_p \propto x^2$

- 22 A force–extension graph is produced for a metal wire.

What **must** describe the limit of proportionality of the wire?

- A the point at which the wire breaks
B the point beyond which Hooke's law is not obeyed
C the point beyond which the wire cannot return to its original length
D the point beyond which the wire starts to deform plastically