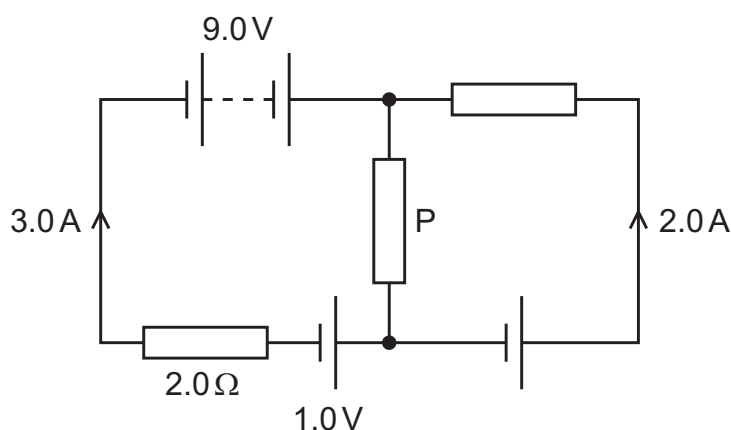


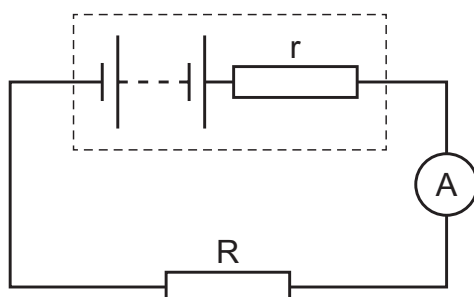
- 34** The diagram shows a circuit containing a battery and cells with negligible internal resistance.
- Some values of current, electromotive force (e.m.f.) and resistance are shown.
- One resistor is labelled P.



What is the resistance of resistor P?

- A** $0.40\ \Omega$ **B** $0.80\ \Omega$ **C** $2.0\ \Omega$ **D** $2.8\ \Omega$

- 35** The diagram shows a circuit with a battery connected to a resistor R. The battery has an internal resistance represented by resistor r.

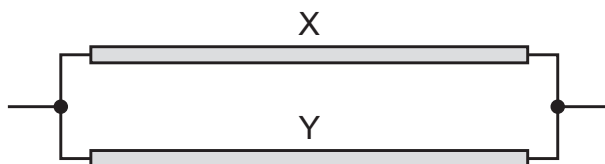


A second resistor, identical to R, is connected in parallel with R.

Which row describes the changes to the potential difference (p.d.) across r and the current shown on the ammeter when the second resistor is connected?

	p.d. across r	current shown on ammeter
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

- 36** Two identical wires X and Y, each of length L and radius r , are connected in parallel as shown.



The total resistance of this combination is R_1 .

Wire X is replaced with a wire of the same material with length L and radius $2r$.

The total resistance of the new combination is R_2 .

What is the ratio $\frac{R_1}{R_2}$?

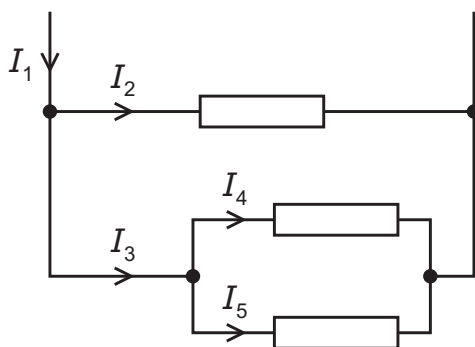
A $\frac{2}{5}$

B $\frac{2}{3}$

C $\frac{3}{2}$

D $\frac{5}{2}$

- 37** The diagram shows the currents in part of an electric circuit.



The resistors are identical.

Which equation is **not** correct?

A $I_1 = I_2 + I_4 + I_5$

B $I_2 = I_1 - I_3$

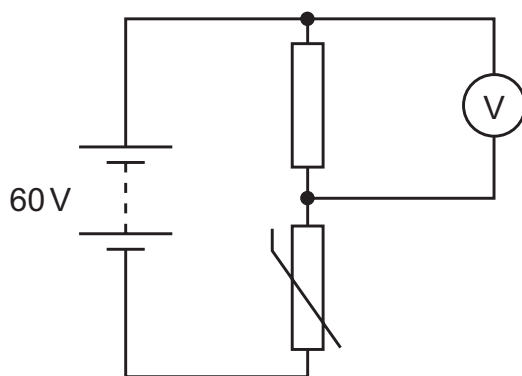
C $I_2 = I_3 + I_4 + I_5$

D $I_4 = I_3 - I_5$

- 34** A cell of electromotive force (e.m.f.) E delivers a charge Q to an external circuit.

Which statement is correct?

- A** The energy dissipated in the external circuit is EQ .
 - B** The energy dissipated within the cell is EQ .
 - C** The external resistance is EQ .
 - D** The total energy dissipated in the cell and the external circuit is EQ .
- 35** The diagram shows a circuit with a battery of electromotive force (e.m.f.) 60 V and negligible internal resistance, a $20\text{ k}\Omega$ resistor, a thermistor and a voltmeter. The resistance of the thermistor is $20\text{ k}\Omega$.



The temperature of the thermistor decreases, and this causes its resistance to change by 50%.

After this change, what is the reading on the voltmeter?

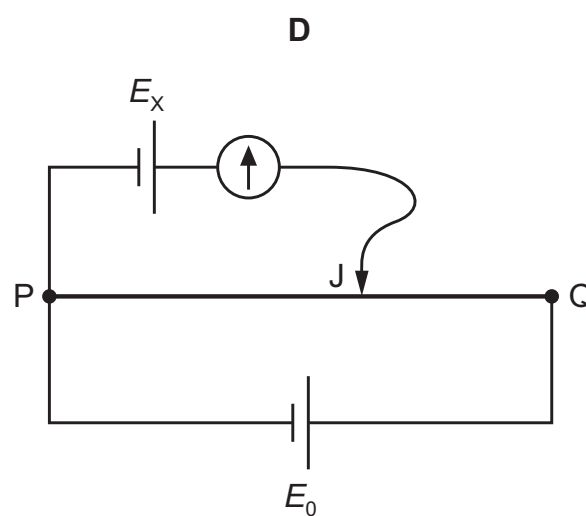
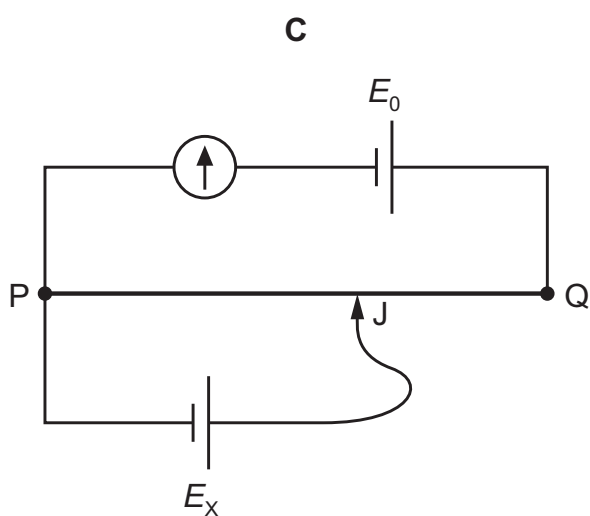
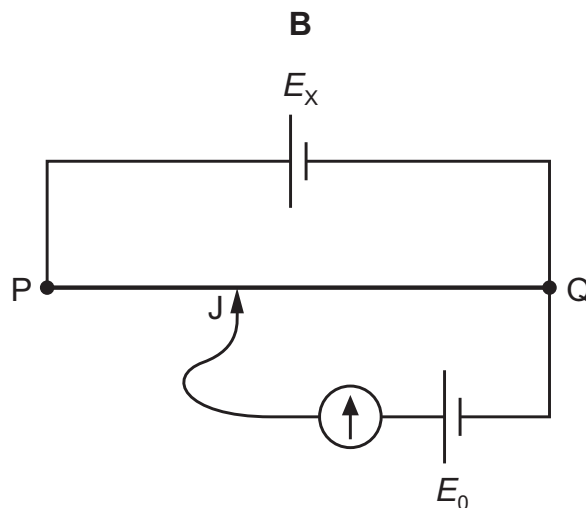
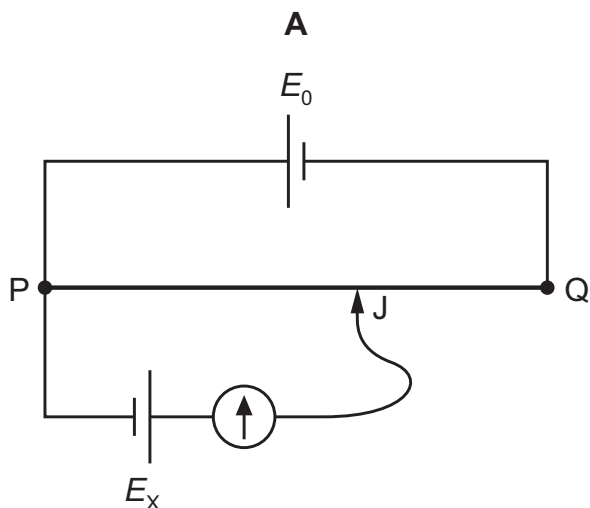
- A** 20 V
- B** 24 V
- C** 36 V
- D** 40 V

- 36** A potentiometer circuit is used to determine the electromotive force (e.m.f.) E_x of a cell. The circuit includes a second cell of known e.m.f. E_0 and negligible internal resistance, and a uniform resistance wire PQ of known length.

E_x is less than E_0 .

The movable connection J can be positioned anywhere along the length of the resistance wire.

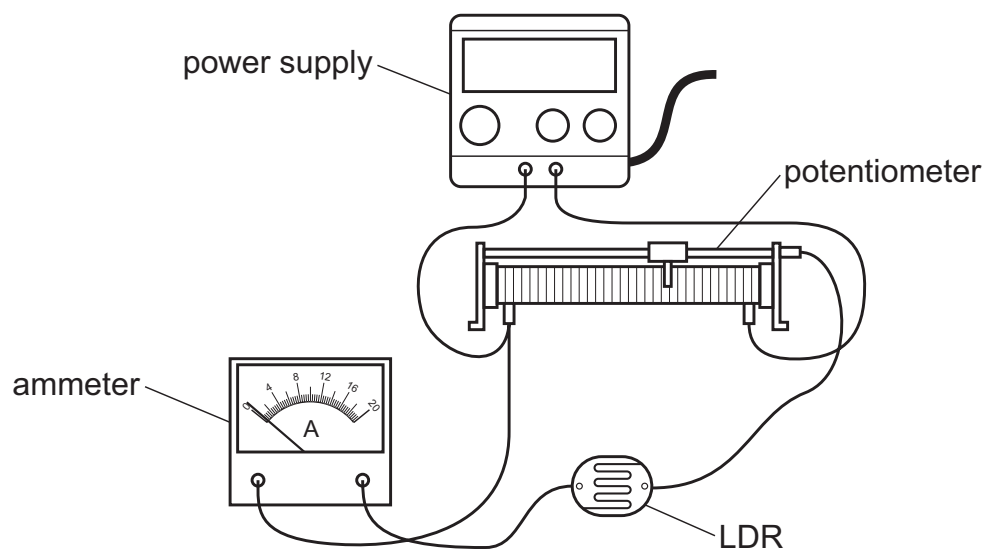
Which circuit is suitable for determining E_x ?



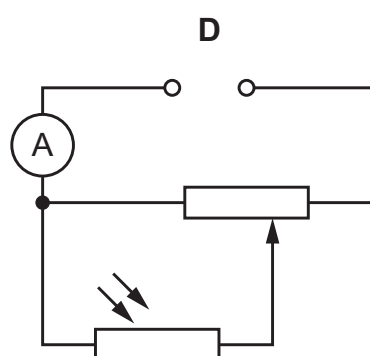
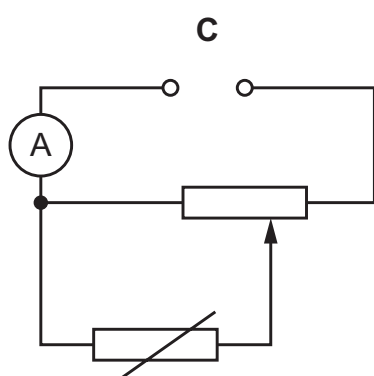
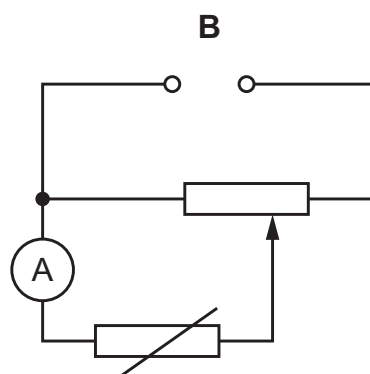
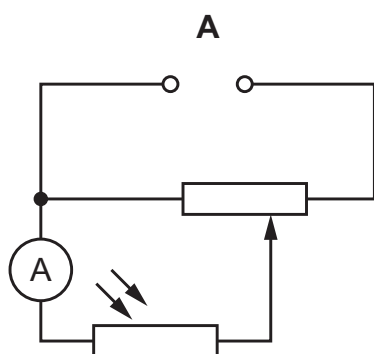
- 37** The principles of conservation of which two quantities are associated with Kirchhoff's first and second laws?

	first law	second law
A	charge	energy
B	charge	voltage
C	energy	charge
D	voltage	charge

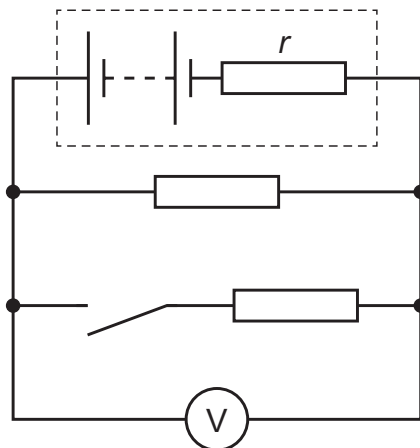
33 The diagram shows an electrical circuit containing a light-dependent resistor (LDR).



What is the circuit diagram for this circuit?



- 37** The circuit diagram shows a battery with internal resistance r , two resistors, a switch and a voltmeter. The switch is open.



The switch is now closed.

What happens to the current in the battery, and what happens to the reading on the voltmeter, when the switch is closed?

	current in battery	reading on voltmeter
A	increases	decreases
B	increases	remains the same
C	remains the same	decreases
D	remains the same	remains the same