OCR (A) Physics A-level

PAG 04.2 - Investigating Circuits with Several Sources of EMF

Practical Flashcards

How do you calculate the total pd of multiple cells in series?

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The total pd of multiple cells in series is equal to the sum of their individual potential differences. Take care to include the polarity of the sources in your summation.

If two identical cells are connected in parallel, what is their combined potential difference?

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When connected in parallel, each source has the same potential difference across it and their terminals meet at the same points. This means the pd across the parallel combination is equal to the pd across each cell individually.

Why should you never connect cells of different voltages in parallel?

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Since the terminals meet at the same points, the cells will try to force the pd across each cell to be the same. This forcing of charge can result in the cells burning out and failing.

How can the potential difference across a component be measured?

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A voltmeter can be connect in parallel to the component to measure the potential difference across it.

Suggest why the reading given by a voltmeter may differ slightly from the true value.

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Voltmeters are assumed to have infinite resistance and so it is assumed that no current is drawn through them. In reality a very small current may be drawn, resulting in the reading differing slightly from the true value.

Why is the terminal pd of a cell different to its emf?

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Cells have an internal resistance over which there will be a voltage drop. This means that potential difference at the cell's terminals will be less than the emf of the cell.

If two cells are connected in series with opposite polarities, how is the total pd obtained?

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The total potential difference across them is obtained by subtracting one from the other, since their polarities are opposite.

What is Kirchhoff's voltage law?

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Kirchhoff's voltage law states that the sum of all the voltage drops around any closed loop in a circuit must equal zero.

What is Kirchhoff's current law?

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Kirchhoff's current law states that the sum of all the currents at a node in a circuit must always equal zero.

How can the current passing through a component be measured?

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An ammeter can be connected in series with the component to measure the current passing through it.

What safety precautions should be taken when carrying out this experiment?

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The cells used should have low voltages so that the circuit doesn't become too hot. Avoid touching bare metal contacts, and take care when handling components and wires since they may be hot.

What device could be used to measure the resistance of a component?

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An Ohmmeter or multimeter can be used to measure resistance.