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SPECA

GCSE Combined Science (AQA Trilogy) · Physics

Electricity · Tiered Worksheet

Section A: Foundation

Current, potential difference, and resistance

1) Explain what a circuit needs, in addition to a complete conducting loop, for a current to flow. **[1]**

2) Define electric current, and state its unit. **[2]**

3) Calculate the charge that flows when a current of 3 A flows for 40 s. **[2]**

4) Calculate the potential difference across a resistor of resistance 15 Ω when a current of 2 A flows through it. **[2]**

5) A component has a potential difference of 12 V across it and a resistance of 4 Ω. Calculate the current flowing through it. **[2]**

6) Explain how the resistance of a filament lamp changes as it heats up, and how this affects the current for a given potential difference. **[2]**

7) Describe how the resistance of a thermistor changes with temperature, and give one everyday use of this behaviour. **[2]**

8) Describe how the resistance of an LDR changes with light intensity, and give one everyday use. **[2]**

9) Two resistors, of resistance 6 Ω and 9 Ω, are connected in series. Calculate the total resistance of the combination. **[3]**

Series and parallel circuits, mains electricity, and power

10) State one fact about current, and one fact about potential difference, in a series circuit containing two lamps. **[2]**

11) Explain why adding a resistor in parallel to an existing circuit decreases the total resistance of the circuit. **[2]**

12) State the frequency and the typical potential difference of the UK mains electricity supply. **[2]**

13) State the colour of the live wire and the colour of the earth wire in a three-core mains cable. **[2]**

14) Explain why the earth wire is a safety feature, even though it does not normally carry a current. **[2]**

15) Calculate the power of a device that has a current of 4 A flowing through it when connected to a 230 V supply. **[2]**

16) Calculate the power dissipated in a resistor of resistance 5 Ω carrying a current of 2 A. **[2]**

17) Calculate the energy transferred by a 1200 W device running for 300 seconds. **[2]**

18) State the equation linking energy transferred, charge flow, and potential difference. **[1]**

19) Describe the role of step-up transformers in the National Grid. **[2]**

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Section B: Higher (in addition to Section A)

The transformer equation

20) State the transformer equation relating primary and secondary potential difference and current. **[1]**

21) A step-up transformer has a primary potential difference of 400 V and a primary current of 15 A. Its secondary potential difference is 6000 V. Calculate the secondary current. **[3]**

22) A step-down transformer has a primary current of 2 A and a secondary current of 40 A. Its secondary potential difference is 12 V. Calculate the primary potential difference. **[3]**

23) Explain why a step-up transformer used at a power station increases potential difference but decreases current, for the same power transmitted. **[2]**

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