Electromagnetic Spectrum

1. What is the purpose of the earth wire in a domestic electrical system?

- *To provide a safe path for electrical current to flow back to the ground in case of a fault, preventing electric shock.*

2. What colour is the neutral wire in a plug?

- *Blue*

3. How does a fuse protect electrical circuits in the home?

- *It melts (blows) when current exceeds a certain limit, breaking the circuit and preventing overheating or fires.*

4. What is the typical voltage of domestic electricity supply in the UK?

- *230 Volts.*

5. Why are appliances with metal cases connected to the earth wire?

- *To prevent electric shock by directing any leaked current into the ground, away from the user.*

6. Calculate the power used by a device that operates at 230 V and draws a current of 5 A.

- *P=VI =230×5 = 1150 Watts or 1.15 kW*

7. What is the difference between the live wire and the neutral wire in a domestic electrical system?

- *The live wire carries current to the appliance, and the neutral wire completes the circuit back to the source.*
- *The live wire is at a high voltage, while the neutral wire is close to earth potential.*

8. Calculate the working current of a 230V 2500W tumble dryer and suggest a suitable fuse for the plug.

- *P = VI*
- *2500 = 230 x I*
- *I = 2500/230*
- *= 10.9A*
- *A 13A fuse would be suitable.*

9. Why is it dangerous to have a broken earth wire on an appliance?

- *Without a safe path to ground, any fault that makes the appliance live can cause electric shock upon touching.*

10. Explain the term "double insulation" and why some appliances do not need an earth wire.

- *Appliances with double insulation have two layers of protection and do not require an earth wire since there is minimal risk of the outer casing becoming live.*

11. Describe how the power rating of a fuse is chosen for a particular appliance.

- *It should be slightly above the normal operating current of the appliance to allow normal operation but blow in case of a significant overload.*

12. What happens if a fuse with too high a rating is used in an appliance?

- *It may not protect the circuit adequately, allowing potentially dangerous overheating.*

13. How does the grounding (earthing) system protect people from electric shocks?

- *It provides a low-resistance path to ground, reducing the risk of electric shock by diverting excess current away from people.*

14. Describe the role of the neutral wire in completing an electrical circuit in the home.

- *Completes the circuit by providing a return path for the current back to the power source.*

15. Explain the concept of "electrical power" and how it relates to the energy used by appliances.

- *It's the rate at which electrical energy is consumed or transferred by an appliance, measured in Watts (W).*