

O Level Physics

Tutorial 16: Practical Electricity

Syllabus :

(a) describe the use of the heating effect of electricity in appliances such as electric kettles, ovens and heaters

(b) recall and apply the relationships $P = VI$ and $E = VIt$ to new situations or to solve related problems

1. An electric kettle contains 500 g of water at 25 °C. It has an electrical rating of 240 V, 5 A. The specific heat capacity of water is 4200 J/kg/°C. Find the time it takes to reach boiling. State what assumption you have to make.

(c) calculate the cost of using electrical appliances where the energy unit is the kW h

2. The cost of electricity is 30.65 cents/kWh (GST included). Find cost of heating the water in the previous question.

(d) state the hazards of using electricity in the following situations: (i) damaged insulation (ii) overheating of cables (iii) damp conditions

3. State the hazards of using electricity in the following situations:

- (i) damaged insulation,
 - (ii) overheating of cables,
 - (iii) damp conditions.
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(e) explain the use of fuses and circuit breakers in electrical circuits and of fuse ratings

4. (i) What is the use of a fuse? What is meant by fuse rating?
- (ii) What is the use of a circuit breaker?

(iii) Which one can be reset?

(f) explain the need for earthing metal casings and for double insulation

5. (a) Explain the need for earthing metal casings of an electrical appliance.
(b) Explain what double insulation means, and why it is needed.

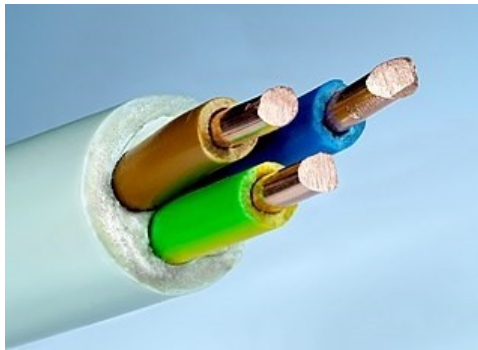


Figure 16-1

(g) state the meaning of the terms live, neutral and earth

6. State the meaning of
- (i) live wire,
 - (ii) neutral wire and
 - (iii) earth wire.

(h) describe the wiring in a mains plug

7. Describe the wiring in a mains plug.

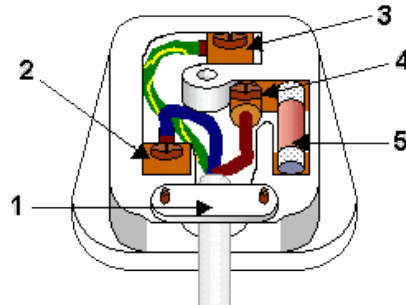


Figure 16-2

(i) explain why switches, fuses, and circuit breakers are fitted to the live wire.

8. Explain why switches, fuses, and circuit breakers are fitted to the live wire and not the neutral wire.

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