203: Electrical installations technology  
**Worksheet 15: Protective devices**

**Answer guide**

Try the following problems.

1. **What is meant by the term ‘overcurrent’?**

**A current exceeding the rated value. For conductors the rated value is the**

**current‑carrying capacity**

1. **Overcurrent can be subdivided into two categories, which are:**

**overload current**

**fault current.**

1. **What is meant by the term ‘overload current’?**

**An overcurrent occurring in a circuit which is electrically sound**

1. **What is meant by the term ‘fault current’?**

**A current resulting from a fault**

1. **What is meant by the term ‘protective conductor current?**

**Electric current appearing in a protective conductor, such as leakage current or electric current resulting from an insulation fault**

1. **List the five sizes of BS3036 fuses including their colours.**

**5A (white)**

**15A (blue)**

**20A (yellow)**

**30A (red)**

**45A (green)**

**State three advantages of BS3036 fuses.**

**Simple to check if blown**

**Low cost to replace fuse element**

**No moving parts.**

1. **State three disadvantages of BS3036 fuses.**

Select three from:

**Danger of being repaired with wrong size wire**

**Deteriorate with age**

**Circuit cannot be quickly restored**

**Cannot break large fault currents**

**Danger if replaced on faulty circuit (melting wire)**

**Fusing factor of around 1.8–2.0 means they cannot be guaranteed to operate up to twice the rated current that is flowing. As a result, cables protected by them must have a larger current‑carrying capacity.**

1. **State three advantages of BS88‑3:2010 fuses.**

Select three from:

**small physical size**

**no mechanical moving parts**

**accurate current rating**

**not liable to deterioration with age**

**fusing factor 1.6–1.9.**

1. **State three disadvantages of BS88 3:2010 fuses.**

**More expensive than rewireable**

**Can be shorted by silver foil**

**Cannot break large fault currents**

**State three advantages of BS88‑2:2010 fuses.**

Select three from:

**no mechanical moving parts**

**declared rating is very accurate**

**operation is very quick**

**with gM fuses you can distinguish between a persistent fault and a transient fault such as the large starting current taken by motors**

**reliable – it can break large current safely**

**fusing factor 1.25–1.70.**

1. **State a disadvantage of BS88‑2:2010 fuses.**

**Expensive**

1. **State three advantages of BS EN 60898 circuit breakers.**

Select three from:

**tripping characteristics, and therefore circuit protection, are set by the installer**

**circuit protection difficult to interfere with**

**the circuit provides discrimination**

**a faulty circuit may be easily and quickly restored by an unskilled operator.**

1. **State a disadvantage of BS EN 60898 circuit breakers.**

**They contain mechanical moving parts**

1. **State the three type classifications of circuit breakers currently available.**

**Type B**

**Type C**

**Type D**

1. **State the general principle of operation of an RCD.**

**An RCD compares the current flowing out through the line conductor with the current returning through the neutral; if the current exceeds a predetermined value, the device will trip and disconnect the circuit.**