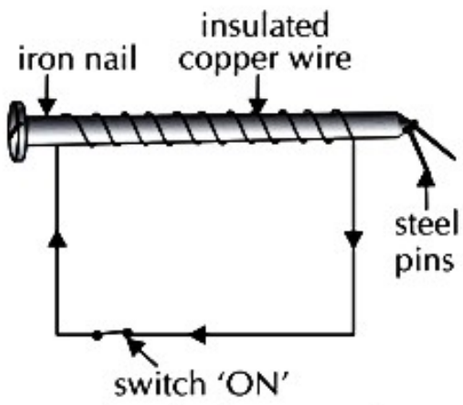
3. Electromagnets are used in
   (i) motors that drive fans, mixers, washing machines, etc.
   (ii) cranes to lift heavy loads like big machines, steel girders and scrap iron objects for loading and unloading purposes.
   (iii) electric bells, telegraphs, telephone instruments, loudspeakers, etc.
4. (a) Overloading of electric circuit
   (b) We can learn to be alert all the time and doing right thing at the right time.

H. Long Answer Questions.

1. An electromagnet is a magnet consisting of a coil of insulated copper wire wound around a soft iron rod that is magnetised only when an electric current is passed through it.

   To make an electromagnet – Wind the insulated copper wire around the iron nail so that it forms a coil. Connect the free ends of the coil of wire to the two terminals of an electric cell through a switch. Now, place some steel pins near one of the ends of the iron nail. Switch 'ON' the current. We find that steel pins cling to the tip of the nail. It has become an electromagnet now.



An electromagnet

2. (a) Advantages of an electromagnet over a permanent magnet are–
   (i) The magnetism of an electromagnet can be switched 'ON' or 'OFF' as desired. This is not possible with a permanent magnet.
   (ii) An electromagnet is stronger than a permanent magnet.

Electromagnet can be made very strong by increasing the number of turns and the amount of current passing through the coil. On the other hand, a permanent magnet cannot be made so strong.

Electromagnet is used in an electric bell.

(b) The strength of an electromagnet can be increased by

(i) increasing the number of turns in the coil.

(ii) increasing the amount of current passing through the coil.