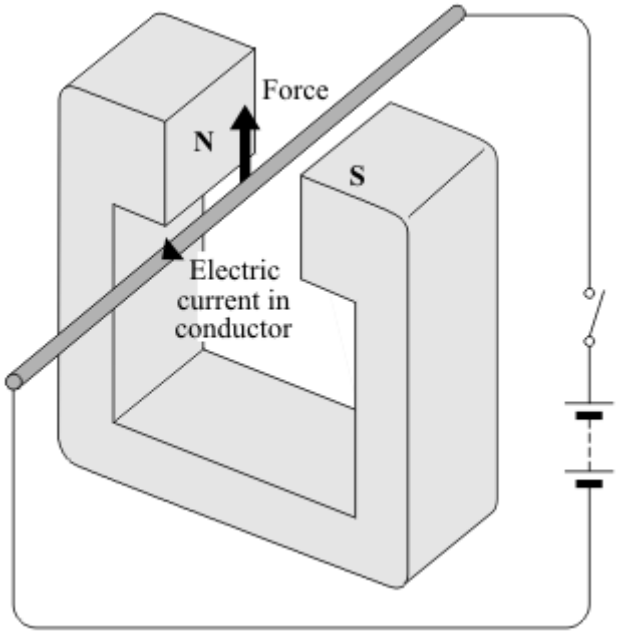
Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Q1.

When a conductor carrying an electric current is placed in a magnetic field a force may act on it.



(a) State **two** ways in which this force can be increased.

1. _____

2. _____

(2)

(b) State **two** ways in which this force can be made to act in the opposite direction.

1. _____

2. _____

(2)

(c) In what circumstance will **no** force act on a conductor carrying an electric current and in a magnetic field?

_____

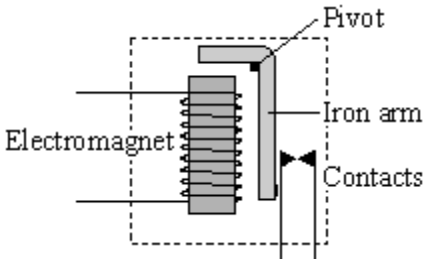
_____

(1)

(Total 5 marks)

Q2.

The diagram shows a switch that is operated by an electromagnet.

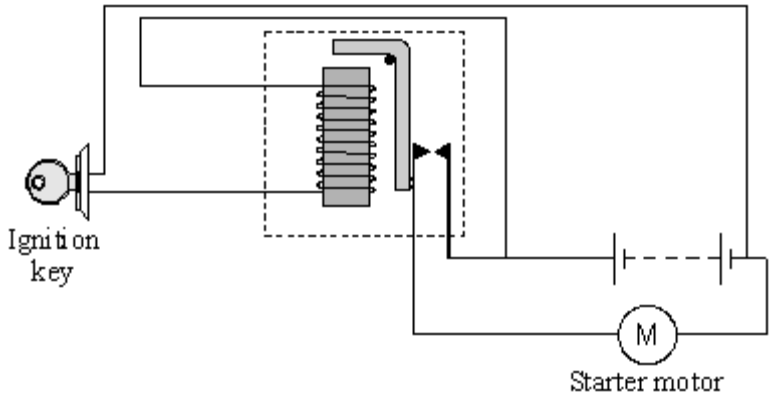


(i) What is this type of switch called?

_____

(1)

(ii) The switch is used in a car starter motor circuit.



Explain how turning the ignition key makes a current flow in the starter motor. The explanation has been started for you.

When the ignition key is turned _____

_____

_____

_____

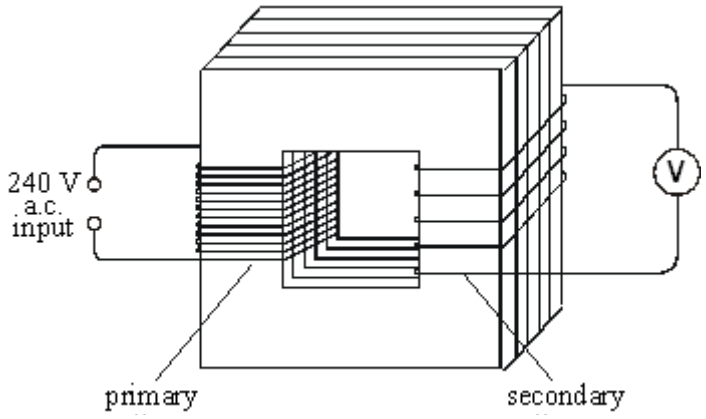
_____

(3)

(Total 4 marks)

Q3.

The diagram below shows a transformer.



(i) Name the material used to make the core of the transformer.

_____

(1)

(ii) The primary coil has 48 000 turns and the secondary coil 4000 turns.

If the input voltage is 240 V a.c., calculate the output voltage.

_____

_____

Answer _____ V

(2)

(iii) Explain how the use of such a transformer could be adapted to transform a low voltage into a higher voltage.

_____

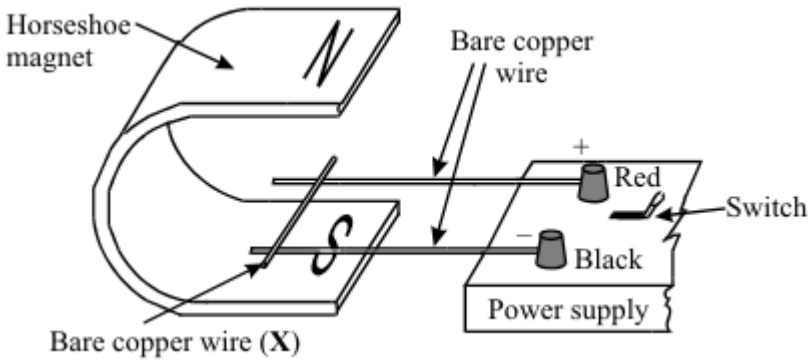
_____

(1)

(Total 4 marks)

Q4.

The diagram shows apparatus used to demonstrate the motor effect. **X** is a short length of bare copper wire resting on two other wires.



(a) (i) Describe what happens to wire **X** when the current is switched on.

_____

_____

_____

(ii) What difference do you notice if the following changes are made?

A The magnetic field is reversed.

_____

_____

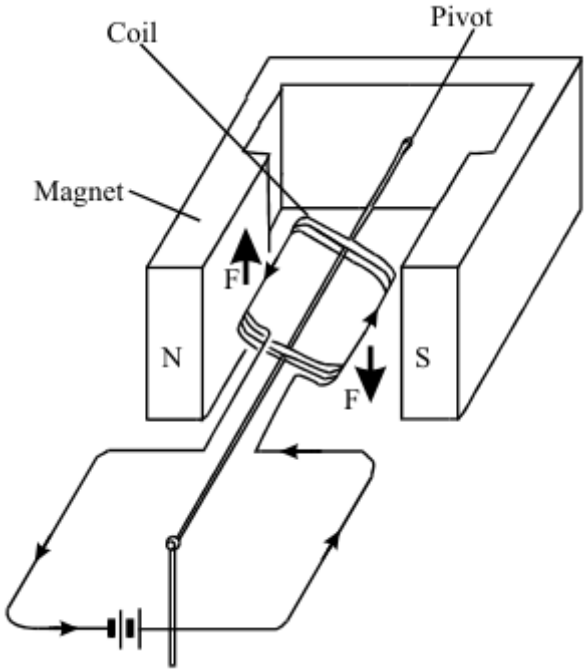
B The current is increased.

_____

_____

(3)

(b) The diagram shows a coil placed between the poles of a magnet. The arrows on the sides of the coil itself show the direction of the conventional current.



The arrows labelled **F** show the direction of the forces acting on the sides of the coil. Describe the motion of the coil until it comes to rest.

_____

_____

_____

_____

_____

(3)

(c) Most electric motors use electromagnets instead of permanent magnets. State three of the features of an electromagnet which control the strength of the magnetic field obtained.

1. _____

2. _____

3. _____

(3)

(Total 9 marks)