

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

(a) the coil moves through the (magnetic) field

or

the coil cuts (magnetic) field lines

1

a potential difference is induced (across the coil)

1

there is a complete circuit, so a current is induced (in the coil)

1

(because) each half-revolution, the two ends of the coil swap from one brush to the other

or

each half-revolution, (the two halves of) the commutator switch brushes / contacts

(because) the half of the coil connected to each brush

always moves in the same direction

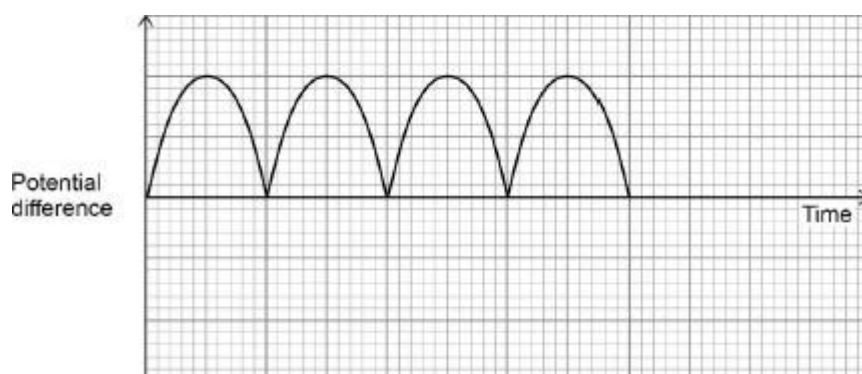
1

(so) the direction of the (induced) current / potential difference does not reverse every half rotation

allow the direction of the (induced) current / potential difference is the same every half rotation

1

(b)



allow a correct graph showing a negative output potential difference only

1

(c) (after disconnection) there is no (induced) current

1

(so) no magnetic field (produced around / by the coil)

1

to oppose the movement of the coil
allow no force opposes the movement of the coil

1

[9]

Q2.

- (a) A primary coil
and
B secondary coil

1

C iron core

1

(b)
$$\frac{230}{V_s} = \frac{200}{1200}$$

1

$$V_s = \frac{1200 \times 230}{200}$$

1

$$V_s = 1380 \text{ (V)}$$

1

- (c) (the alternating current causes) a changing magnetic field around the primary (coil)

1

creates magnetic field that changes direction in the core
allow creates a changing magnetic field in the core

1

this induces an alternating potential difference across the secondary (coil (causing an alternating current)

1

- (d) down

1

(e) $B = 60 \times 10^{-6} \text{ T}$

1

$$0.045 = 60 \times 10^{-6} \times 50 \times I$$

allow correct substitution of incorrectly / not converted value of B

1

$$I = \frac{0.045}{60 \times 10^{-6} \times 50}$$

allow correct rearrangement using an incorrectly / not converted value of B

1

$$I = 15 \text{ (m)}$$

allow a correct calculation using an incorrectly / not converted value of B

1

(e) the wire / force is at right angles to the magnetic field

allow the current is constant

allow the cable is straight

allow the field is uniform

allow the force is constant

1

[14]