5 **(a)** The square loop ***abcd*** is placed in a region of uniform magnetic field of flux density *B* as shown in Fig. 5.1. The loop carries a steady current I in the direction as shown. Dotted lines CD, EF, GH and JK are axes of symmetry through the centre of the square loop.

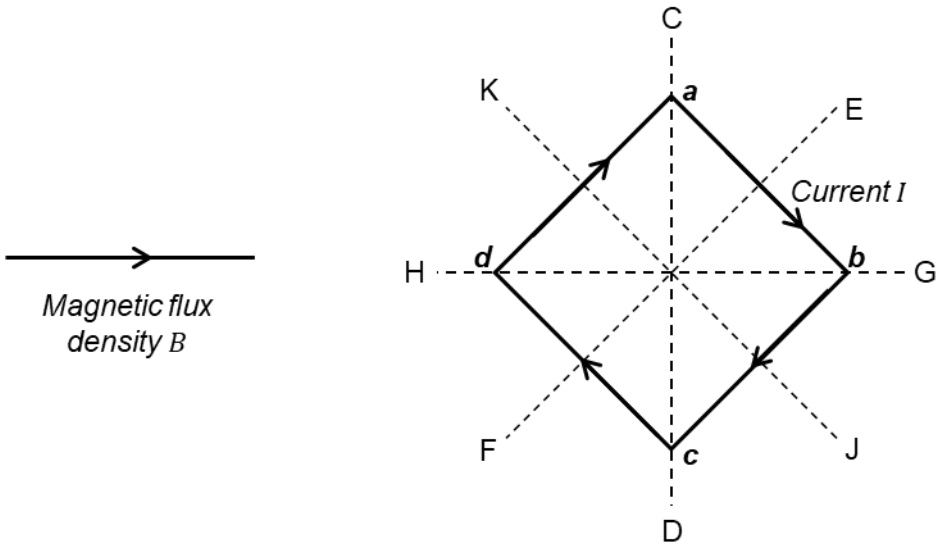

Fig. 5.1

(i) State the axis (CD, EF, GH or JK) about which the square loop will rotate.

……..……. [1]

(ii) State and explain the direction of rotation of the square loop about the axis you have identified in **(a)(i)**.

……..

……..

……..

……..

……..

……..

……..

……..

…….. [4]

(b) The square loop in Fig. 5.2 is made of wires with total series resistance of 10.0 Ω. It is placed in a uniform magnetic field of magnetic flux density 0.100 T directed perpendicularly into the plane of the diagram.

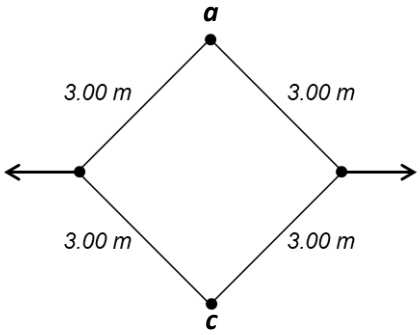

Fig. 5.2

The loop which is made of inextensible wires is hinged at each corner. In a time of 0.100 s, it is pulled in the directions as shown by the arrows until the separation between points ***a*** and ***c*** is 2.00 m.

(i) Determine the average induced e.m.f. in the loop.

average induced e.m.f. = …… V [4]

(ii) Hence, or otherwise, find the induced current in the loop.

induced current = …… A [1]

[Total: 10]