6 Fig. 6.1 shows a magnetic field of flux density 5.0×10^{-5} T passing through a short-circuited coil of wire at an angle of 60° to the plane of the horizontal non-magnetic table on which the coil rests. The coil has 400 turns and an area of 25 cm^2.

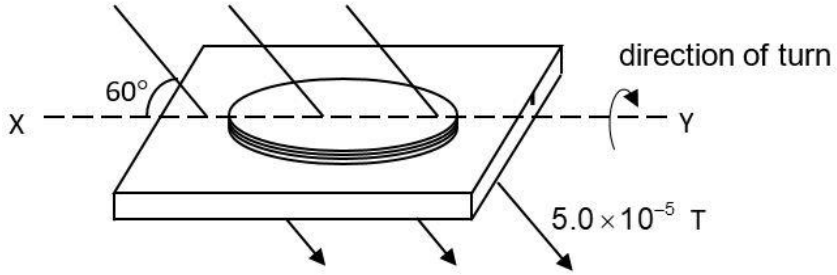

Fig. 6.1

(a) Calculate the magnetic flux linkage through the coil of wire at the above-mentioned position.

flux linkage = …….. Wb-turns [2]

(b) After an initial push, the coil rotates by 180° about the axis XY in the direction shown in Fig. 6.1 in a duration of 2.5 s. Calculate

(i) the change in magnetic flux linkage of the coil,

change in flux linkage = …… Wb-turns [1]

(ii) the average e.m.f. induced.

e.m.f. = …… V [2]

(c) On Fig. 6.1, indicate the direction of the induced current in the coil immediately as it is being turned from the position shown. [1]

(d) Explain why the coil slows down and stops after it turns over by 180°. State the energy changes that take place.

……..

……..

…….. [2]

[Total: 8]

Section B

Answer **one** question from this Section in the spaces provided.