**(Q4)** An inductor has an inductance which is found experimentally to be of the form where L0 = 30 mH,  = 0.87 mm, and  is the displacement of a movable element. Its winding resistance is measured and found to equal 110 m.

(a) The displacement  is held constant at 0.90 mm, and the current is increased from 0 to 6.0 A. Find the resultant magnetic stored energy in the inductor.

(b) The current is then held constant at 6.0 A, and the displacement is increased to 1.80 mm. Find the corresponding change in magnetic stored energy.