FIGURE 4 shows two inductances connected in parallel across an a.c.

supply.

(a) Apply Kirchhoff’s voltage law to each loop of circuit.

(b) Hence or otherwise obtain the current ratio I1/I2 in terms of the circuit

 inductances.

(c) See if you can show that L1 and L2 can be replaced by the equivalent

 L1 L2 – M 2

 inductor of FIGURE 4 where Leq 

 L1 L2 – 2 M

(d) A 1 nF capacitor is placed across the two inductors (FIGURE 4 (c)).

 If L1 = L2 = L and k = 0.5, determine the required value of L if the

minimum current I flows from the supply when it is at a frequency of

1 MHz.

6

I

I1

V

L1

M

I2

L2

V

Leq

I

(a)

I

I1

V

L1

M

I2

L2

(b)

(c)

FIG. 4