

# A.C CIRCUITS

## PREVIOUS EAMCET BITS

1. The natural frequency of an L – C circuit is 1, 25,000 cycle/s. Then the capacitor c is medium of dielectric constant K. In this case, the frequency decreases by 35 kHz. The value of K is

[EAMCET 2007 E]

- 1) 3.0                      2) 2.1                      3) 1.56                      4) 1.7

Ans:3

Sol. We know that  $n = \frac{1}{2\pi\sqrt{LC}}$

$$n_1 = \frac{1}{2\pi\sqrt{LC}} = 1,25,000\text{Hz} \dots (1)$$

$$n_2 = \frac{1}{2\pi\sqrt{LKC}} = 1,00,000\text{Hz} \dots (2)$$

$$\text{Dividing } \frac{(1)}{(2)} \Rightarrow \sqrt{K} = \frac{5}{4} \Rightarrow K = 1.56$$

Hence (3) is the correct choice.

2. The inductance L(in mH) of the coil which is to be connected in series with a capacitor of 0.3 pF to get an oscillatory frequency of 1 M HZ is

[EAMCET 2005 M]

- 1) 8.44    2) 84.4                      3) 844                      4) 8440

Ans: 2

Sol. Frequency  $n = \frac{1}{2\pi\sqrt{LC}} \Rightarrow L = \frac{1}{4\pi^2 n^2 c}$

Substituting values in above equation

$$L = 84.4\text{mH}$$

