Q.1 A transformer has a turns ratio, $\frac{N_s}{N_p} = 4$. If a **200 V AC** voltage is applied across its primary coil, and it carries **1 A** current, find current in the circuit connected to the secondary coil if the transformer is **80**% efficient.



- Q.2In an LC oscillator circuit, L = 10 mH, $C = 40 \mu F$. At t = 0, the capacitor is fully charged with
 $q_0 = 4 \mu C$. Find the current in the circuit, when the capacitor and inductor share energies equally.
(A)0.2 Ma(B)4.5 mA(C)0.3 mA(D)2.2 Ma
- **Q.3** In the circuit shown below, the switch is connected to position **1** for a very long time. What is the maximum current flowing through the circuit, when the switch is taken to position**2**?



Q.4 The electrical energy across the capacitor in the LC circuit, oscillates with an angular frequency of – L Is the inductance and C is the capacitance

$$(\mathbf{A})_{\overline{\sqrt{\mathrm{LC}}}}^{2} \qquad \qquad (\mathbf{B})_{\overline{\sqrt{\mathrm{LC}}}}^{1} \qquad \qquad (\mathbf{C})\sqrt{\mathrm{LC}} \qquad \qquad (\mathbf{D})2\sqrt{\mathrm{LC}}$$

- Q.5A capacitor of capacitance, $C = 25 \ \mu F$ is fully charged to $300 \ V$. It is then connected across a $10 \ mH$ inductor. The resistance in the circuit is negligible. Find the frequency of oscillation of the current in
the circuit.(A)220 Hz(B)270 Hz(C)318 Hz(D)412 Hz
- **Q.6** A capacitor of capacitance, $C = 25 \ \mu F$ is fully charged to **300 V**. It is then connected across a **10 mH** inductor at t = 0. The resistance in the circuit is negligible. Find the energy stored in the capacitor at $t = \frac{\pi}{3\omega} s$, where ω is the angular frequency. **(A)**0.9 J **(B)**0.7 J **(C)**0.5 J **(D)**0.3 J
- Q.7 In the LC circuit shown below, $C = 1 \ \mu F$. When the capacitor is fully charged up to $100 \ V$, the switch S is closed at t = 0. The current in the circuit oscillates at a frequency of $10^3 \ Hz$. The value of L will be approximately equal to. Take $\pi^2 \approx 10$



Q.8 For the LC circuit, whose graph of charge (**q**) on capacitor versus time (**t**) is shown in the figure. The frequency of oscillations of charge is –



- Q.9A capacitor of capacitance, $C = 25 \ \mu F$ is fully charged and then connected with an inductor of
inductance, $L = 10 \ mH$. The ratio of magnitude of maximum charge on the capacitor to the
maximum current through the circuit, is -
Assume ideal conditions
(A)1: 2000 (B)2000: 1 (C)1: 1000 (D)1000: 1
- Q.10 The capacitor of an oscillatory LC circuit is enclosed in a container. When the container is empty, the frequency is 10 kHz. When the container is filled with a gas, the frequency changes by 50 Hz. The dielectric constant of the gas is -

(A) 2.01	(B) 1.01	(C) 3.01	(D) 5.01

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(A)	(B)	(A)	(A)	(C)	(D)	(A)	(D)	(A)	(B)