AIPMT 2006

1. A transistor-oscillator using a resonant circuit with an inductor L (of negligible resistance) and a capacitor C in series produce oscillations of frequency f. If L is doubled and C is changed to 4C, then frequency will be :-

(1) $\frac{f}{4}$ (2) 8 f

(3) $\frac{f}{2\sqrt{2}}$ (4) $\frac{f}{2}$

2. A coil of inductive reactance 31Ω has a resistance of 8 Ω. It is placed in series with a condenser of capacitative reactance 25Ω. The combination is connected to an a.c. source of 110 volt. The power factor of the circuit is :-

(1) 0.56 (2) 0.64

(3) 0.80 (4) 0.33

AIPMT 2007

3. What is the value of inductance L for which the current is a maximum in a series LCR circuit with C=10 μF and $\omega = 1000 s^{-1}$?

(1) 10 mH

(2) 100mH

(3) 1 mH

(4) cannot be calculated unless R is known

AIPMT 2008

4. In an a.c. circuit the e.m.f. (e) and the current (i) at any instant are given respectively by :-

$e = E_0 \sin\omega t$ $i = I_0 \sin(\omega t - \phi)$

The average power in the circuit over one cycle of a.c. is :-

(1) $\frac{E_0 I_0}{2}\cos\phi$ (2) $E_0 I_0$

(3) $\frac{E_0 I_0}{2}$ (4) $\frac{E_0 I_0}{2}\sin\phi$

AIPMT 2009

5. Power dissipated in an LCR series circuit connected to an a.c. source of emf ε is :-

(1) $\varepsilon^2 R \Big/ \sqrt{R^2 + \left(L\omega - \frac{1}{C\omega}\right)^2}$

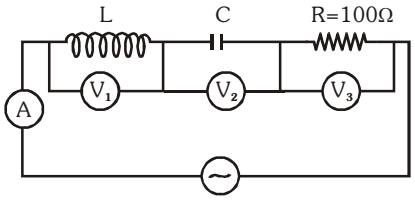
(2) $\varepsilon^2 R \Big/ \left[R^2 + \left(L\omega - \frac{1}{C\omega}\right)^2\right]$

(3) $\varepsilon^2 \sqrt{\left[R^2 + \left(L\omega - \frac{1}{C\omega}\right)^2\right]} \Big/ R$

(4) $\frac{\varepsilon^2\left[R^2 + \left(L\omega - \frac{1}{C\omega}\right)^2\right]}{R}$

AIPMT Pre. 2010

6. In the given circuit the reading of voltmeter V_1 and V_2 are 300 volts each. The reading of the voltmeter V_3 and ammeter A are respectively :



(1) 100 V, 2.0 A (2) 150 V, 2.2 A

(3) 220 V, 2.2 A (4) 220 V, 2.0 A

AIPMT Mains 2010

7. A condenser of capacity C is charged to a potential difference of V_1. The plates of the condenser are then connected to an ideal inductor of inductance L. The current through the inductor when the potential difference across the condenser reduces to V_2 is ?

(1) $\frac{C(V_1^2 - V_2^2)}{L}$ (2) $\frac{C(V_1^2 + V_2^2)}{L}$

(3) $\left(\frac{C(V_1^2 - V_2^2)}{L}\right)^{1/2}$ (4) $\left(\frac{C(V_1 - V_2)^2}{L}\right)^{1/2}$

AIPMT Pre. 2011

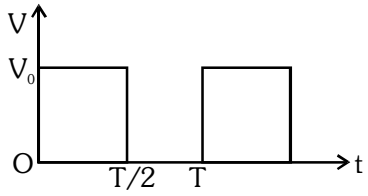
8. An ac voltage is applied to a resistance R and an inductor L in series. If R and the inductive reactance are both equal to 3Ω, the phase difference between the applied voltage and the current in the circuit is :-

(1) $\pi/6$ (2) $\pi/4$ (3) $\pi/2$ (4) Zero

9. In an ac circuit an alternating voltage $e = 200\sqrt{2}\sin 100\,t$ volts is connected to a capacitor of capacity 1μF. The r.m.s. value of the current in the circuit is:-(1) 10 mA (2) 100 mA (3) 200 mA (4) 20 mA

AIPMT Mains 2011

10. The r.m.s. value of potential difference V shown in the figure is :-



(1) $\frac{V_0}{\sqrt{3}}$ (2) V_0 (3) $\frac{V_0}{\sqrt{2}}$ (4) $\frac{V_0}{2}$

11. A coil has resistance 30 ohm and inductive reactance 20 ohm at 50 Hz frequency. If an ac source , of 200 volt, 100 Hz, is connected across the coil, the current in the coil will be :-

(1) 2.0 A (2) 4.0 A (3) 8.0 A (4) $\frac{20}{\sqrt{13}}$ A

AIPMT Pre. 2012

12. In an electrical circuit R, L, C and an a.c. voltage source are all connected in series. When L is removed from the circuit, the phase difference between the voltage and the current in the circuit is $\pi/3$. If instead, C is removed from the circuit the phase difference is again $\pi/3$. The power factor of the circuit is :

(1) 1 (2) $\sqrt{3}/2$ (3) $\frac{1}{2}$ (4) $\frac{1}{\sqrt{2}}$

AIPMT Mains 2012

13. The instantaneous values of alternating current and voltages in a circuit are given as

$i = \frac{1}{\sqrt{2}}\sin(100\,\pi t)$ ampere

$e = \frac{1}{\sqrt{2}}\sin(100\,\pi t + \pi/3)$ volt

The average power in Watts consumed in the circuit is :-

(1) $\frac{1}{2}$ (2) $\frac{1}{8}$ (3) $\frac{1}{4}$ (4) $\frac{\sqrt{3}}{4}$

NEET-UG 2013

14. A coil of self-inductance L is connected in series with a bulb B and an AC source. Brightness of the bulb decreases when :

(1) an iron rod is inserted in the coil.

(2) frequency of the AC source is decreased.

(3) number of turns in the coil is reduced.

(4) A capacitance of reactance $X_C = X_L$ is included in the same circuit.

Re-AIPMT 2015

15. A series R-C circuit is connected to an alternating voltage source. Consider two situations :-

(a) When capacitor is air filled.

(b) When capacitor is mica filled.

Current through resistor is i and voltage across capacitor is V then :-

(1) $V_a = V_b$ (2) $V_a < V_b$

(3) $V_a > V_b$ (4) $i_a > i_b$

AIPMT 2015

16. A resitance 'R' draws power 'P' when connected to an AC source. If an inductance is now placed in series with the resistance, such that the impedance of the circuit becomes 'Z', the power drawn will be:

(1) $P\sqrt{\frac{R}{Z}}$ (2) $P\left(\frac{R}{Z}\right)$ (3) P (4) $P\left(\frac{R}{Z}\right)^2$

NEET-I 2016

17. An inductor 20 mH, a capacitor 50 μF and a resistor 40Ω are connected in series across a source of emf V = 10 sin 340 t. The power loss in A.C. circuit is :-

(1) 0.51 W (2) 0.67 W

(3) 0.76 W (4) 0.89 W

18. A small signal voltage V(t) = V_0 sin ωt is applied across an ideal capacitor C :-

(1) Current I(t), lags voltage V(t) by 90°.

(2) Over a full cycle the capacitor C does not consume any energy from the voltage source.

(3) Current I(t) is in phase with voltage V(t).

(4) Current I(t) leads voltage V(t) by 180°.

NEET-II 2016

19. Which of the following combinations should be selected for better tuning of an L-C-R circuit used for communication ?

(1) R = 15 Ω, L = 3.5 H, C = 30 μF

(2) R = 25 Ω, L = 1.5 H, C = 45 μF

(3) R = 20 Ω, L = 1.5 H, C = 35 μF

(4) R = 25 Ω, L = 2.5 H, C = 45 μF

20. The potential differences across the resistance, capacitance and inductance are 80 V, 40 V and 100 V respectively in an L-C-R circuit. The power factor of this circuit is :-

(1) 0.8 (2) 1.0 (3) 0.4 (4) 0.5

NEET(UG) 2018

21. An inductor 20 mH, a capacitor 100 μF and a resistor 50 Ω are connected in series across a source of emf, V = 10 sin 314 t. The power loss in the circuit is

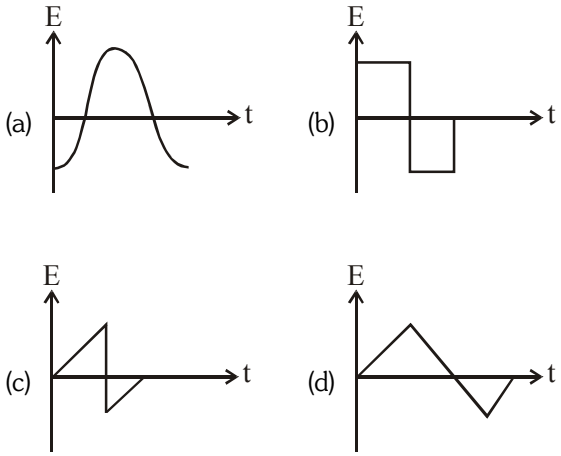
(1) 0.79 W (2) 0.43 W

(3) 2.74 W (4) 1.13 W

AC0119

NEET(UG) 2019 (Odisha)

22. The variation of EMF with time for four types of generators are shown in the figures. Which amongst them can be called AC ?



(1) (a) and (d) (2) (a), (b), (c) and (d)

(3) (a) and (b) (4) only (a)

23. A circuit when connected to an AC source of 12 V gives a current of 0.2 A. The same circuit when connected to a DC source of 12 V, gives a current of 0.4 A. The circuit is

(1) series LR (2) series RC

(3) series LC (4) series LCR

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	3	3	2	1	2	3	3	2	4	3	2	1	2	1	3
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28		
Ans.	4	1	2	1	1	1	2	1	4	4	1	4	3		