

**O P JINDAL SCHOOL, SAVITRINAGAR**

**ASSIGNMENT**

**CLASS XII PHYSICS**

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Why is the use of ac voltage preferred over dc voltage?

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ANS: An ac voltage can be stepped up or down using a transformer, but not the dc voltage.

2 The peak value of emf in ac is  $E_0$ . Write its (i) rms, and (ii) average value over a complete cycle.

1

ANS: (i)  $E_{\text{rms}} = \frac{E_0}{\sqrt{2}}$  (ii) Zero.

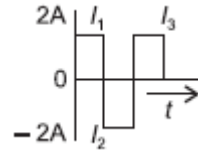
3 The current flowing through a pure inductor of inductance 4mH is  $i = 12 \cos 300 t$  ampere. What is (i) rms, and (ii) average value of the current for a complete cycle?

1

ANS: (i)  $I_{\text{rms}} = \frac{12}{\sqrt{2}}$  (ii)  $I_{\text{av}} = \text{zero}$

4 Calculate the rms value of the alternating current shown in the figure.

1



ANS:  $I_{\text{rms}} = \sqrt{\frac{I_1^2 + I_2^2 + I_3^2}{3}} = \sqrt{\frac{2^2 + 2^2 + 2^2}{3}} = 2 \text{ A}$  The rms value of the alternating current shown in the figure is 2 A.

- 5 In a series *LCR* circuit, the voltages across an inductor, a capacitor and a resistor are 30 V, 30V and 60V respectively. What is the phase difference between the applied voltage and the current in the circuit? 1

ANS: Zero. As  $V_L = V_C$ , circuit is resistive in nature.

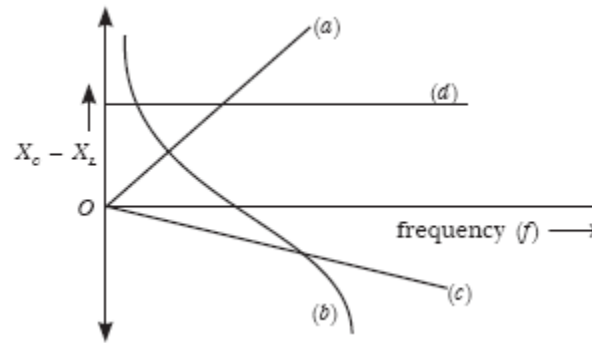
- 6 Can a capacitor of suitable capacitance replace a inductor coil in an *AC* circuit? 1

ANS: Yes, because average power consumed in both is least while controlling an AC.

- 7 When an alternating current is passed through a moving coil galvanometer, it shows no deflection. Why? 1

ANS: A moving coil galvanometer measures an average value of current, which is zero for ac. Hence, no deflection is shown by galvanometer.

- 8 Which of the following curves may represent the reactance of a series *LC* combination? 1



ANS: (b) As  $X_C - X_L = \frac{1}{2\pi \nu C} - 2\pi \nu L$

9 In a series *LCR* circuit,  $V_L = V_C \neq V_R$ . What is the value of power factor?

1

ANS:  $\cos \phi = 1$ .

10 The power factor of an ac circuit is 0.5. What is the phase difference between voltage and current in this circuit?

1

$\therefore$  Power factor,  $\cos \phi = 0.5$

$\therefore \phi = 60^\circ$  or  $\pi/3$

ANS: So, the phase difference between voltage and current is  $\frac{\pi}{3}$ .