

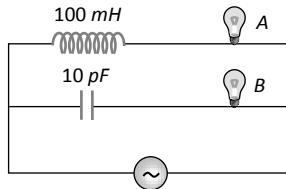
## Topic :-Alternating Current

- Which of the following quantities remains constant in a step-down transformer ?  
a) Current                      b) Voltage                      c) Power                      d) None of these
- The voltage of an ac source varies with time according to the equation  $V = 100\sin 100\pi t \cos 100\pi t$  where  $t$  is in second and  $V$  is in volts. Then  
a) The peak voltage of the source is 100 volts  
b) The peak voltage of the source is 50 volts  
c) The peak voltage of the source is  $100/\sqrt{2}$  volts  
d) The frequency of the source is 50 Hz
- At high frequency, the capacitor offer  
a) More reactance              b) Less reactance              c) Zero reactance              d) Infinite reactance
- A circuit has a resistance of  $12 \Omega$  and an impedance of  $15 \Omega$ . The power factor of the circuit will be  
a) 0.8                              b) 0.4                              c) 1.25                              d) 0.125
- An inductance of  $1 \text{ mH}$  a condenser of  $10 \mu\text{F}$  and a resistance of  $50 \Omega$  are connected in series.  
The reactances of inductor and condensers are same. The reactance of either of them will be  
a)  $100 \Omega$                       b)  $30 \Omega$                       c)  $3.2 \Omega$                       d)  $10^3 \Omega$
- The current flowing in a step down transformer 220 V to 22 V having impedance  $220 \Omega$  is  
a) 1 A                              b) 0.1 A                              c) 2 mA                              d) 0.1 mA
- If  $E = 100\sin(100t)$  volt and  $I = 100\sin\left(100t + \frac{\pi}{3}\right)$  mA are the instantaneous values of voltage and current, then the r.m.s. values of voltage and current are respectively  
a) 70.7V, 70.7mA              b) 70.7V, 70.7A              c) 141.4V, 141.4mA              d) 141.4V, 141.4A

8. An ideal choke draws a current of 8 A when connected to an AC supply of 100 V, 50 Hz. A pure resistor draws a current of 10 A when connected to the same source. The ideal choke and the resistor are connected in series and then connected to the AC source of 150 V, 40 Hz. The current in the circuit becomes

a)  $\frac{15}{\sqrt{2}}$  A                      b) 8 A                      c) 18 A                      d) 10 A

9. If A and B are identical bulbs, which bulb glows brighter



a) A                      b) B                      c) Both equally bright                      d) Cannot say

10. A 280 ohm electric bulb is connected to 200V electric line. The peak value of current in the bulb will be

a) About one ampere                      b) Zero                      c) About two ampere                      d) About four ampere

11. If  $E_0$  represents the peak value of the voltage in an ac circuit, the r.m.s value of the voltage will be

a)  $\frac{E_0}{\pi}$                       b)  $\frac{E_0}{2}$                       c)  $\frac{E_0}{\sqrt{\pi}}$                       d)  $\frac{E_0}{\sqrt{2}}$

12. In  $L - R$  circuit, resistance is  $8 \Omega$  and inductive reactance is  $6 \Omega$ , then impedance is

a)  $2 \Omega$                       b)  $14 \Omega$                       c)  $4 \Omega$                       d)  $10 \Omega$

13. The root mean square value of the alternating current is equal to

a) Twice the peak value                      b) Half the peak value  
c)  $\frac{1}{\sqrt{2}}$  times the peak value                      d) Equal to the peak value

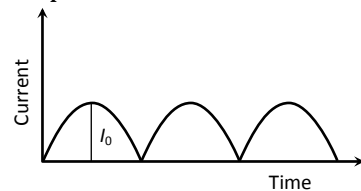
14. What will be the phase difference between virtual voltage and virtual current, when the current in the circuit is wattless

a)  $90^\circ$                       b)  $45^\circ$                       c)  $180^\circ$                       d)  $60^\circ$

15. Power factor is maximum in an  $LCR$  circuit when

a)  $X_L = X_C$                       b)  $R = 0$                       c)  $X_L = 0$                       d)  $X_C = 0$

16. The output current versus time curve of a rectifier is shown in the figure. The average value of output current in this case is

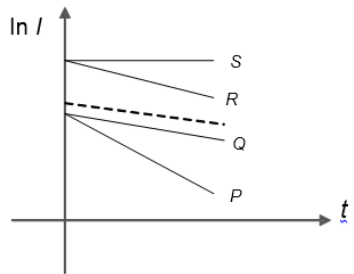


a) 0                      b)  $\frac{I_0}{2}$                       c)  $\frac{2I_0}{\pi}$                       d)  $I_0$

17. In a series resonant  $L - C - R$  circuit, the voltage across  $R$  is 100 V and  $R = 1 k \Omega$  with  $C = 2 \mu F$ . The resonant frequency  $\omega$  is  $200 \text{ rads}^{-1}$ . At resonance the voltage across  $L$  is

a)  $2.5 \times 10^{-2} \text{ V}$                       b) 40 V                      c) 250 V                      d)  $4 \times 10^{-3} \text{ V}$

18. In the previous question, if the direction of  $i$  is reversed,  $(V_B - V_A)$  will be  
 a) 20 V                      b) 15 V                      c) 10 V                      d) 5 V
19. The instantaneous voltage through a device of impedance  $20 \Omega$  is  $e = 80\sin 100 \pi t$ . The effective value of the current is  
 a) 3 A                      b) 2.828 A                      c) 1.732 A                      d) 4 A
20. In an  $R$ - $C$  circuit while charging, the graph of  $\ln I$  versus time is as shown by the dotted line in the adjoining diagram where  $I$  is the current. When the value of the resistance is doubled, which of the solid curves best represents the variation of  $\ln I$  versus time?



- a)  $P$                       b)  $Q$                       c)  $R$                       d)  $S$

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