



Ch—07 Alternating Current

Daily Practice Problem 05

Q1. A capacitor and a resistor are connected in series with an a.c.source. If the potential differences across C,R are 120 V,90 V respectively and if the rms current of the circuit is 3 A, calculate the

(i) impedance (ii) power factor of the circuit.

11 Ω and an impedance 22 Ω . The power consumed is

- (a) 275W
- (b) 366 W
- (c) 550 W
- (d) 1100 W

Q2. A group of electric lamps having a total power rating of 1000 W is supplied by an ac voltage $E=200 \sin(310t+60^\circ)$. Then the r.m.s value of the circuit current is

- (a) 10 A
- (b) $10\sqrt{2}$ A
- (c) 20 A
- (d) $20\sqrt{2}$ A

Q3. The r.m.s. current in an ac circuit is 2 A. If the wattless current be $\sqrt{3}$ A ,what is the power factor?

- (a) $\frac{1}{\sqrt{3}}$
- (b) $\frac{1}{\sqrt{2}}$
- (c) $\frac{1}{2}$
- (d) $\frac{1}{3}$

Q4. An rms voltage of 110 V is applied across a series circuit having a resistance

Q5. An alternating voltage $\varepsilon=200 \sin 300 t$ is applied across a series combination of $R=10\Omega$ and an inductor of 800 mH. Calculate:

- (i) Impedance of the circuit
- (ii) Peak value of current in the circuit.
- (iii) Power factor of the circuit.

Q6. A virtual current of 4 A flows in a coil when it is connected in a circuit having alternating current of frequency 50 Hz. Power consumed in the coil is 240W. Calculate the inductance of the coil if the virtual potential difference across it is 100 V

Q7. The potential difference E and current I flowing through the ac circuit is given by $E = 5\cos(\omega t - \frac{\pi}{6})V$ and $I = 10 \sin \omega t$ A. Find the average power dissipated in the circuit.

ANSWERS

1. (i) $50\ \Omega$ (ii) 0.6

5. (i) $240.2\ \Omega$

6. $\frac{1}{5\pi}\ H$

2. (b)

(ii) 0.832 A

3. (c)

(iii) 0.041

7. 12.5 W

4. (a)