1. The peak value of an alternating current is I_o. Its mean square value is

(a) 0 (b) $2I_o$

(c) I_o^2 (d) $\frac{I_o^2}{2}$

2. The frequency of an alternating current in our homes is 50 Hz. It means that in one second, a bulb will light

(a) up 50 times (b) off 50 times

(c) up 100 times (d) off 25 times

3. A voltmeter reads 220 V for an alternating source. The root mean square value of this voltage is

(a) 220 V (b) 314 V

(c) 154 V (d) 110 V

4. An alternating voltage is given by $V = 310 \sin(100\pi t)$ volt. The peak value of this voltage is

(a) 434 V (b) 310 V

(c) 620 V (d) 0

5. Through a capacitor

(a) D.C will flow only

(b) A.C. will flow only

(c) both A.C. and D.C. will flow

(d) neither A.C. nor D.C. will flow

6. In a circuit containing capacitor, the voltage

(a) leads the current by 90°

(b) is in phase with current

(c) lags the current by 90°

(d) none of these

7. The A.C. used around the world has frequency

(a) 50 Hz (b) 60 Hz

(c) either 50 Hz or 60 Hz (d) none of these

8. In an A.C. circuit containing inductor

(a) D.C. will not flow

(b) A.C. will not flow
(c) neither A.C. nor D.C will flow
(d) none of these

9. The reactance of an inductor is given by

(a) $X_L = 2\pi f L$ (b) $X_L = \frac{2\pi f}{L}$

(c) $X_L = \frac{1}{2\pi fL}$ (d) $X_L = 2fL$

10. In an inductor the voltage

(a) leads the current by 90° (b) lags the current by 90°
(c) is in phase with current (d) neither of these

11. The inductor has a resistance to the alternating current because

(a) the solenoid is made of wire
(b) the solenoid produces magnetic field
(c) the self induction induces back emf in it
(d) neither of these

12. An inductance having some resistance is connected to an A.C. source. Which of the quantities is zero over one cycle?

(a). Induced emf (b) Joule's heat
(c) Energy stored (d) All of these

13. There is no reactance of a circuit. The circuit may contain

(a) an inductor only
(b) a capacitor only
(c) both inductor and capacitor
(d) none of these

14. A bulb and a capacitor are connected in series. On increasing the frequency of the voltage source, the

(a) impedance of the circuit will increase
(b) the bulb will get dim
(c) impedance of the circuit will decrease
(d) none of these

15. An alternating voltage and current are represented by 220 sin ($\omega t + \pi/6$) and 5 sin ($\omega t - \frac{\pi}{3}$) respectively. The impedance of the circuit is

(a) 1100 Ω (b) 44 Ω
(c) 33 Ω (d) none of these

16. In which of the following A.C. circuits, the instantaneous current is zero when the instantaneous voltage is maximum?

(a) Resistive
(b) Capacitive
(c) Inductive
(d) Both capacitor and inductor in series

17. A resistor and an inductor are connected in series. On increasing the frequency of the applied A.C. voltage source

(a) the impedance of the circuit will increase
(b) the impedance of the circuit will decrease
(c) the resistance of the bulb will increase
(d) the resistance of the bulb will decrease

18. In a three phase A.C. supply

(a) the three currents differ in phase from one another by 90°
(b) the three currents differ in phase from one another by 120°
(c) the total current is never zero at any instant
(d) none of these

19. In an RLC series circuit with A.C. source, at resonance

(a) $R = 0$ (b) $L = C$
(c) $X_L = X_C$ (d) $f = 2\pi\sqrt{LC}$

20. The power factor

(a) depends on the phase angle between voltage and current
(b) does not depend on the phase angle between voltage and current
(c) has its maximum value 2
(d) none of these

21. Choose the correct statement:

(a) A 3-phase motor has high power factor
(b) A 3-phase motor has low power factor;
(c) A single phase motor has low power factor
(d) Both single phase and 3-phase motors have the same power

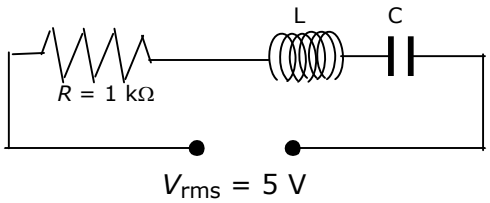
22. A resistance and a capacitance are connected to an A.C. source in series. The impedance of the circuit is maximum when

(a) $R = 0$ (b) C is very large

(c) frequency is very low (d) frequency is very large

23. In the circuit shown, the frequency of the A.C. source is adjusted until the circuit is at resonance. At this frequency, the reactance of the inductor is 1000 Ω. The rms value of potential difference across the inductor in volt is then

(a) 0.05
(b) 5
(c) 50
(d) 500



24. In an RLC circuit, the frequency of the supply is adjusted so that the current registered is maximum. The value of capacitance and inductance and frequency remain unchanged but the resistance is increased by a factor of 4. The current will

(a) stay the same (b) increase by a factor of 2
(c) increase by a factor of 4 (d) decrease by a factor of 4

25. The impedance of an inductor connected to an A.C. source is

(a) less than its D.C. resistance
(b) equal to its D.C. resistance
(c) greater than its D.C. resistance
(d) all of these

26. In an A.C. circuit, the current and voltage are out of phase by 90°. The ammeter reads 2 A and voltmeter reads 120 V. The power expended in the circuit in watts is

(a) 60 (b) 30
(c) 120 (d) zero

27. In an electric circuit the applied A.C. voltage is $V = 100 \sin (314\, t)$ volt and the current in the circuit is $I = 5 \sin (314\, t + \pi/3)$ A. Then the component in the circuit is

(a) *L* only (b) *C* only
(c) *R* and *L* (d) *R* and *C*

28. Square root of the mean squared value of ac voltage is called

(a) peak value (b) rms value
(c) p-p value (d) none of these

29. The magnitude of r.m.s value of ac voltage can be expressed as

(a) $V_{rms}=\frac{V_o+V_o}{2}$ (b) $V_{rms} = \frac{V_0^2 + V_0^2}{2}$

(c) $V_{rms} = \frac{V_o}{\sqrt{2}}$ (d) all of the above

30. An AC voltmeter reads 220V. Its peak value is

(a) 350 V (b) 311 V
(c) 250 V (d) 220 V

31. An AC continuously flows through the plates of a capacitor because of

(a) charging of plates
(b) discharging of plates
(c) both charging and discharging
(d) dielectric present between the plates

32. The opposition offered by a capacitor to the flow of an AC is called

(a) capacitance (b) reactance X
(c) inductance L (d) none

33. The reactance of Xc of a capacitor joined across a alternating source can be found by a relation

(a) $X_C = \frac{I_{rms}}{V_{rms}}$ (b) $X_C = \frac{V_{rms}}{I_{rms}}$

(c) $X_C=V_{rms}+ I_{rms}$ (d) $X_C=\frac{\sqrt{V_{rms}}}{I_{rms}}$

34. The unit of reactance is

(a) farad (b) tesla
(c) ohm (d) volts

35. The impedance *Z* of a *RC* circuit joined across an alternating source of frequency *f* is

(a) $Z = 2\pi fC$ (b) $Z = \sqrt{R^2 + (2\pi fC)^2}$

(c) $Z = \sqrt{R^2 + \frac{1}{(2\pi fC)^2}}$ (d) $Z = 2\pi f/C$

36. The combined effect of resistance R and reactance X is known as

(a) capacitance (b) resistance
(c) impedance (d) none

37. The impedance Z can expressed by

(a) $Z = \frac{V}{I}$ (b) $Z = \frac{I}{V}$
(c) $Z = I + V$ (d) $Z = I - V$

38. Ohm is the unit of

(a) resistance (b) impedance
(c) reactance (d) all of the above

39. The frequency at which a 2 H inductor has a reactance of 1000 Ω is

(a) 79.5 Hz (b) 160 Hz
(c) 240 Hz (d) 500 Hz

40. The phase angle between current and voltage in a series RC circuit is given by

(a) $\tan\theta = \frac{1}{\omega R}$ (b) $\tan\theta = \frac{1}{\omega CR}$
(c) $\tan\theta = \frac{\omega}{CR}$ (d) $\tan\theta = \omega CR$

Key to Test Chapter 16

1	**D**	21	**B**
2	**c**	22	**c**
3	**a**	23	**b**
4	**b**	24	**d**
5	**b**	25	**c**
6	**c**	26	**d**
7	**c**	27	**d**
8	**b**	28	**b**
9	**a**	29	**c**
10	**a**	30	**b**
11	**c**	31	**c**
12	**a**	32	**b**
13	**c**	33	**b**
14	**c**	34	**c**
15	**b**	35	**c**
16	**d**	36	**c**
17	**a**	37	**a**
18	**b**	38	**d**
19	**c**	39	**a**
20	**a**	40	**b**