

1. The voltage between any two phases of a three phase system is known as

- (a) Line voltage (b) Phase voltage
(c) Mains voltage (d) Supply voltage

Ans-a

2. Overhead system:

- (a) Has more faults than underground system
(b) Gives a good look
(c) Has high initial cost
(d) Fault location is very difficult

Ans-a

3. A distribution system consists of

- (a) Distributor
(b) Feeders
(c) Service mains
(d) All of the above

Ans-d

4. Feeders may be defined as

- (a) conductors which deliver power to consumer's premises
(b) conductors which deliver current to service mains
(c) conductors which carry current to the feeding points
(d) none of these

ans-c

5. Economizer is used in a thermal power plant

- (a) To heat the feed water
(b) Condensation of steam
(c) To heat air
(d) To handle ash

Ans-a

6. Resistance temperature coefficient of copper at 20°C is

- a) 0.0045/°C
b) 0.0017/°C
c) .004/°C
d) 0.0038/°C

Ans-c

7. Two parallel conductors current in opposite directions will exert on each other

- a) an attractive forces
b) a repulsive forces
c) an axial force
d) no force

ans-b

8. The unit of reluctance of magnetic circuit is

- a) AT/m
b) Weber/m
c) AT/wb
d) Weber/AT

Ans-c

9. A balanced 3-phase, 3-wire supply feeds balanced star connected resistors. If one of the resistors is disconnected, then the percentage reduction in load will be,

- a) 33.33 b) 50 c) 66.67 d) 75

ans-b

10. The total flux at the end of a long permanent bar magnet is 100×10^{-6} Wb. The end of this magnet is withdrawn through a 1000 turn coil in $\frac{1}{20}$ seconds the induced e.m.f. in the coil is

- a) 20.0 V
b) 2.0 V
c) 0.2 V
d) 0.02 V

Ans-c

11. In a balanced 3-phase circuit, the line current is 12 A. When the power is measuring by two wattmeter method, one meter reads 11 kW while the other reads zero. Power factor of the load is

- a) 0 b) 0.5 c) 0.866 d) 1.0

ans-b

12. Ampere-second is the unit of

- a) emf b) power
c) electric charge d) energy

ans-c

13. Mho relay is normally used for the protection of

- a) Long transmission lines
b) Medium length lines
c) Short length lines
d) No length criterion

Ans-a

14. A reactance relay is

- a) Voltage restrained directional relay
b) Direction restrained over-current relay
c) Voltage restrained over-current relay
d) None of these

Ans-b

15. A Buchholz relay is used for the protection of

- a) a transformer against all internal faults
b) a transformer against external faults
c) a transformer against both internal and external faults
d) protection of induction motors

ans-a

16. In a series R-L-C circuit the 'Q-factor' is given by

a) $Q = \frac{1}{R} \sqrt{\frac{L}{C}}$

reactance values are 4 ohm each. In this circuit

- the current leads the voltage by 45°
- the current lags the voltage by 45°
- the current lags the voltage by 60°
- None of the above

Ans-b

24. Superposition theorem requires as many circuits to be solved as there are

- nodes
- sources
- loops
- None of the above

Ans-b

25. The average value of the voltage waves

$$v = 110 + 175 \sin(314t - 25^\circ) \text{ volts is}$$

- 110 V
- 175 V
- 165.75 V
- 206.7 V

ans-a

26. Mho relay is usually employed for the protection of

- short lines only
- medium lines only
- long lines only
- any line

ans-c

27. Three inductors each of 60 mH are connected in delta. The value of inductance of each arm of the equivalent star connection is

- 10 mH
- 15 mH
- 20 mH
- 30 mH

ans-c

28. The magnetic field energy in an inductor changes from maximum value to minimum value in 5 m sec when connected to an ac source. The frequency of the source in Hz is

- 500
- 200
- 50
- 20

20

ans-c

29. A voltage source having an open-circuit voltage of 150 V and internal resistance of 75Ω , is equivalent to a current source of

- 2 A in series with 75Ω
- 2 A in a parallel with 37.5Ω
- 2 A in parallel with 75Ω
- 1 A in parallel with 150Ω

Ans-c

30. Two coupled coils, connected in series, having an equivalent inductance of 16 mH or 8 mH depending on the connection. The mutual inductance between the coils is

- 12 mH
- $8\sqrt{2}$ mH

c) 4 mH d) 2 mH
ans-d

31. Tesla is the unit of

- a) electric flux density
- b) magnetic field intensity
- c) electric field intensity
- d) magnetic flux density

ans-d

32. Which one of the following is a valid value of coefficient of coupling between two inductors?

- a) 1.414 b) 0.9 c) 1.732
- d) 17.32

ans-b

33. A resistance and another circuit elements are connected in series across a dc voltage V. The voltage across the resistance is zero after some time. The other element is pure

- a) Capacitance
- b) Both a) and c)
- c) Resistance
- d) Inductance

Ans-d

34. For RLC ac series circuits at resonance the current is

- a) Minimum at leading p.f.
- b) Minimum at lagging p.f.
- c) Maximum at unity p.f.
- d) Maximum at leading p.f.

Ans-c

35. A series R-L-C circuit resonates at 1 MHz. At frequency 1.1 MHz the circuit impedance will be

- a) Resistive
- b) Will depend on the relative amplitude of R, L and C
- c) Capacitive
- d) Inductive

Ans-d

36. Application of Thevenin's Theorem in a circuit results in

- a) An ideal voltage source
- b) An ideal current source
- c) A current source and an impedance in parallel
- d) A voltage source and an impedance in series

Ans-d

37. Three resistances 5Ω each are connected in star. Values of equivalent delta resistances are

- a) 1.5Ω each b) 2.5Ω each
- c) $5/3\Omega$ each d) 15Ω each

ans-d

38. The bandwidth of an ac series circuit consisting of R, L and C is

- a) $\frac{L}{R}$ b) $\frac{R}{L}$ c) $\frac{L}{RC}$ d) $\frac{RC}{L}$

ans-b

39. For balanced 3-phase supply system, the phasor sum of the line currents is NOT zero if the load is

- a) Balanced delta connected
- b) Unbalanced delta connected
- c) Balanced star connected
- d) Unbalanced star/delta connected

Ans-b

40. At series resonance of an ac R-L-C circuit the impressed voltage is

- a) Equal to the resistive drop
- b) Equal to the capacity drop
- c) Greater than the resistive drop
- d) Equal to the inductive drop

Ans-a

41. A $10\ \mu F$ and $20\ \mu F$ capacitor are in series. The combination is supplied at 150 V from a sinusoidal voltage source. The voltage across the $20\ \mu F$ capacitor is then.

- a) 75 V
- b) 125 V
- c) 100 V
- d) 50 V

ans-d

42. SI unit of Electrical Energy is

- a) Watt-Second
- b) Joule
- c) KWh
- d) Volt-Ampere-Second

Ans-b

43. Two wires A and B of the same material but of different lengths L and

2L have the radius r and 2r respectively. The ratio of specific resistance will be

- a) 1 : 4
- b) 1 : 8
- c) 1 : 1
- d) 1 : 2

ans-c

44. A 20 micro farad capacitor is connected across an ideal voltage source. The current in the capacitor

- a) Will be very high at first, then exponentially decay and at steady state will become zero.
- b) None of these are true
- c) Will be zero at first, then exponentially rise
- d) Will be very high at first, then exponentially decay

Ans-a

45. Which of the following materials possesses the least resistivity?

- a) Iron
- b) Manganin
- c) Aluminum
- d) Copper

Ans-d

46. The resistance of insulations, in general, _____ with temperature rise.

- a) Decreases
- b) Increases rapidly
- c) Increases slowly

d) Does not change

Ans-a

47. An electric iron is rated at 230 V, 400 W, 50 Hz. The voltage rating 230 V refers to

- a) Rms value
- b) Peak-to-peak value
- c) Average value
- d) Peak value

Ans-a

48. In a series RLC circuit $R = 20\Omega$, $X_L = 30\Omega$ and $X_C = 30\Omega$. If the supply voltage across the combination is $v = 100 \sin(100\pi t + 30^\circ)$ Volts, the instantaneous current and the power factor of the circuit are respectively

- a) $I = 3.536 \sin(100\pi t + 30^\circ)$ Amps, p.f. = 0.866
- b) $I = 5 \sin(100\pi t + 30^\circ)$ Amps, p.f. = unity
- c) $I = 3.536 \sin(100\pi t + 30^\circ)$ Amps, p.f. = unity
- d) $I = 5 \sin(100\pi t + 30^\circ)$ Amps, p.f. = 0.866

Ans-b

49. The rms value of the alternating current given by the equation

$$i = 50 \sin(314t - 10^\circ) + 30 \sin(314t - 20^\circ)$$

- a) 41.23 A
- b) 58.31 A
- c) 38.73 A

d) 77.43 A

Ans-a

50. A series R-L-C circuit will have unity power factor if operated at a frequency of in Hz.

- a) $1/(2\pi\sqrt{LC})$
- b) LC
- c) $1/(LC)$
- d) $1/\sqrt{LC}$

Ans-a

51. Most economic load on an overhead line is

- a) greater than the natural load
- b) less than the natural load
- c) equal to the natural load
- d) none of these

ans-b

52. Form factor of an alternating wave is

- a) Form factor = $\frac{\text{average value}}{\text{rms value}}$
- b) Form factor = $\frac{(\text{rms value})^2}{\text{average value}}$
- c) Form factor = $\frac{\text{rms value}}{\text{average value}}$
- d) Form factor = rms value \times average value

Ans-c

53. The phase difference between the following voltage and current waves,

$$v = 311 \sin(100\pi t + 30^\circ) \text{ Volts}$$

$$i = 17 \sin(100\pi t - 20^\circ) \text{ Amps}$$

a) 20° b) 50° c) 10° d) 30°

ans-b

54. In an R-L series $R = 20\Omega$, $L = 0.056$ H and the supply frequency is $f = 50$ Hz. The magnitude impedance of the circuit is

- a) 26.64Ω b) 20.0Ω
b) 37.6Ω d) 20.056Ω

ans-a

55. In the measurement of power in a balanced 3-phase circuit by two-wattmeter method if the two wattmeter's show equal readings then the power factor of the circuit is

- a) Zero
b) Unity
c) 0.8 Lagging
d) 0.8 Leading

Ans-b

56. Given two coupled inductors L_1 and L_2 having their mutual inductance M . The relationship among them must satisfy

- a) $M > L_1 L_2$ b) $M = K\sqrt{L_1 L_2}$
c) $M = L_1 L_2$ d) $M > \frac{L_1 + L_2}{2}$

ans-b

57. If the length of a bar of magnetic material is increased by 20% and the cross-sectional area is decreased by 20%, then the reluctance is

- a) Increased by 50%
b) Remaining same
c) Decreased by 33%
d) Increased by 67%

Ans-b

58. The coupled inductors $L_1 = 0.2$ H and $L_2 = 0.8$ H, have coefficient of coupling $K = 0.8$. the mutual inductance M is

- a) 0.16 H b) 0.02 H
c) 0.32 H d) 0.24 H

ans-c

59. A coil with a certain number of turns has a specified time constant. If the number of turns is doubled, its times constant would

- a) Becomes four fold
b) Get halved
c) Remain unaffected
d) Become doubled

Ans-a

60. The mutual inductance between two closely coupled coils is 1H. If the turns of one coil is decreased to half and those of the other is doubled, the new value of the mutual inductance would be

- a) $1/4$ H b) 1H c) 2H d) $1/2$ H

Ans:- b)

61. Two inductors have self inductance of 9 mH and 25 mH. The mutual inductance between the two is 12 mH. The coefficient of inductive coupling between the two inductors is

- a) 18.75 b) 0.25
c) 0.8 d) 1.25

ans-c

62. A wattmeter is being tested under phantom loading condition. If the wattmeter reading is 60 W, the actual power consumed from the supply, is

- a) much higher than 60 W
b) 60 W
c) much less than 60 W
d) 30 W

Ans-a

63. The insulation of modern EHV lines is designed based on

- a) the lightning
b) corona
c) radio interference
d) switching voltage

ans-d

64. The ratio of resistance of a 100 W, 220 V lamp to that of 100 W, 110 V lamp will be at respective voltages

- a) 4 b) 2 c) 1/2
d) 1/4

ans-a

65. Two sinusoidal equations are given as

$$e_1 = A \sin\left(\omega t + \frac{\pi}{4}\right) \text{ and } e_2 = A \sin\left(\omega t - \frac{\pi}{6}\right)$$

The phase difference between the two quantities is

- a) 75° b) 60°
c) 105° d) 15°

ans-a

66. If four $10 \mu F$ capacitors are connected in parallel, the net capacitance is

- a) $2.5 \mu F$ b) $40 \mu F$
c) $20 \mu F$ d) $15 \mu F$

ans-b

67. The earth's potential is taken as

- a) infinite b) supply voltage
c) 1 volt d) zero

ans-c

68. Permeance is analogous to

- a) Conductance
b) Reluctance
c) Inductance
d) Resistance

Ans-a

69. The normal way to close an SCR is by appropriate

- a) gate current
b) cathode current
c) anode current
d) forward current

ans-c

70. The curve representing Ohm's law is

- a) Linear b) Hyperbolic
c) Parabolic d) Triangular

ans-a

71. Specific resistance of a conductor depends upon

- a) Dimension of the conductor
b) Composition of conductor material
c) Resistance of the conductor
d) Both a) and b)

Ans-b

72. Superposition theorem is essentially based on the concept of

- a) Reciprocity
b) Linearity
c) Duality
d) Non-linearity

Ans-b

73. If a 500 KVA, 200 Hz transformer is operated at 50 Hz, its KVA rating will be

- a) 2000 KVA b) 125 KVA
c) 250 KVA d) 1000 KVA

ans-b

74. In an R-L-C circuit susceptance is equal to

- a) $\frac{1}{X}$ b) $\frac{1}{R}$ c) $\frac{R}{Z^2}$ d) $\frac{X}{Z^2}$

ans-d

75. Two heaters rated a 1000 W, 250 V each are connected in series across a 250 V, 50 Hz AC mains. The total power drawn from the supply would be

- a) 1000 watt b) 500 watt
c) 250 watt d) 2000 watt

ans-b