

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

- a) 0.0045/°C
- b) 0.0017/°C
- c) 0.00393/°C
- d) 0.0038/°C

[SSC. (JE)-2013]

2. How many watt-seconds are supplied by a motor developing 2 hp (British) for 5 hours?

- a) 2.6856×10^7 watt-seconds
- b) 4.476×10^5 watt-seconds
- c) 2.646×10^7 watt-seconds
- d) 6.3943×10^6 watt-seconds

[SSC. (JE)-2013]

3. Two parallel conductors carrying in opposite directions will exert on each other

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

[SSC. (JE)-2013]

4. The unit of reluctance of magnetic circuit is

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

[SSC. (JE)-2013]

5. 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

[SSC. (JE)-2013]

6. 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 The end of this magnet is withdrawn through a 1000 turn coil in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

[SSC. (JE)-2013]

7. In a balanced 3-phase circuit, the line current is 12 A. When the power is measured 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

[SSC. (JE)-2013]

8. Ampere-second is the unit of

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

[SSC. (JE)-2013]

9. Two lossy capacitors with equal capacitance values and power factors of 0.01 and 0.02 are in parallel, and the combination is supplied from a sinusoidal voltage source. The power factor of the combination is

- a) 0.03
- b) 0.015
- c) 0.01
- d) 0.0002

[SSC. (JE)-2013]

10. A voltmeter when connected across a dc supply, reads 124 V. When a series combination of the voltmeter and an unknown resistance X is connected across the supply, the meter reads 4V. If the resistance of the voltmeter is 50 kΩ, the value of X is

- a) 1550 kΩ
- b) 1600 kΩ
- c) 1.6 kΩ
- d) 1.5 kΩ

[SSC. (JE)-2013]

11. A solenoid of inductance 250 mH and resistance 10Ω is connected to a battery. The time taken for the magnetic energy to reach $\frac{1}{4}$ of its maximum value is

- a) $\log_e(2)$
- b) $10^{-3} \log_e(2)$
- c) $25 \log_e(2)$
- d) $\frac{1}{40} \log_e(2)$

[SSC. (JE)-2013]

12. The instantaneous power of 1-phase series circuit supplying R-L load from a sinusoidal voltage source has in each cycle

- a) negative twice, zero four times
- b) zero twice, negative once
- c) negative four times, zero twice
- d) negative twice, zero once

[SSC. (JE)-2013]

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

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

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

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

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

[SSC. (JE)-2013]

14. In an ac circuit, $V = (200 + j40)V$ and $I = (30 - j10)V$. The active and reactive power of the circuit are respectively

- a) 6400 W, 800 VAR capacitance
b) 6400 W, 800 VAR inductive
c) 5600 W, 3200 VAR capacitive
d) 5600 W, 3200 VAR inductive

[SSC. (JE)-2013]

15. Application of Norton's theorem in a circuit results in

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

[SSC. (JE)-2013]

16. In a series R-L circuit supplied from a sinusoidal voltage source, voltage across R and L are 3 V and 4 V respectively. The supply voltage is then

- a) 7 V b) 1 V c) 3.5 V d) 5 V

[SSC. (JE)-2013]

17. An inductor is supplied from a sinusoidal voltage source. The magnetic field energy in the inductor changes from peak value to minimum value in 10 msec. The supply frequency is

- a) 50 Hz b) 25 Hz
c) 1 kHz d) 100 Hz

[SSC. (JE)-2013]

18. Two 2000 Ω , 2 watt resistors are connected in parallel. Their combined resistance value and wattage rating are

- a) 1000 Ω , 2 watt
b) 1000 Ω , 4 watt
c) 2000 Ω , 4 watt
d) 2000 Ω , 2 watt

[SSC. (JE)-2013]

19. We have three resistance each of value 1 Ω , 2 Ω , and 3 Ω . If all the three resistances are to be connected in a circuit, how many different values of equivalent resistance are possible?

- a) Five b) Six
c) Seven d) Eight

[SSC. (JE)-2013]

20. One B.O.T. unit is

- a) 1000 kWh b) 10 kWh
c) 1 kWh d) 0.1 kWh

[SSC. (JE)-2013]

21. Three 3 μF capacitors are in series. A 6 μF capacitor is in parallel with this series arrangement. The equivalent capacitance of this combination is

- a) 7 μF b) 15 μF c) 3.6 μF d) 1 μF

[SSC. (JE)-2013]

22. In 1-phase series RL circuit fed by voltage source, the resistance and reactance values are 4 ohm each. In this circuit

- a) the current leads the voltage by 45°
b) the current lags the voltage by 45°
c) the current lags the voltage by 60°
d) None of the above

[SSC. (JE)-2013]

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

- a) nodes
b) sources
c) loops
d) None of the above

[SSC. (JE)-2013]

24. Three equal impedances are first connected in delta across a 3-phase balanced supply. If the

same impedances are connected in star across the same supply

- phase currents will be $\frac{1}{3}$ of the previous value.
- line currents will be $\frac{1}{3}$ of the previous value.
- power consumed will be $\frac{1}{3}$ of the previous value
- power consumed will be 3 times the previous value

[SSC. (JE)-2013]

25. The average value of the voltage waves

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

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

[SSC. (JE)-2013]

26. A current from an ac source bifurcates into branches A and B in parallel. Branch A is an inductor with $30 \mu H$ inductance and 1Ω resistance. Branch B is another inductor with inductance L and 1.5Ω resistance. For the ratio of currents in the branches to be independent of supply frequency, value of L should be

- $30.5 \mu H$
- $20 \mu H$
- $45 \mu H$
- $29.5 \mu H$

[SSC. (JE)-2013]

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

[SSC. (JE)-2013]

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

[SSC. (JE)-2013]

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

[SSC. (JE)-2013]

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
- 4 mH
- 2 mH

[SSC. (JE)-2013]

31. Tesla is the unit of

- electric flux density
- magnetic field intensity
- electric field intensity
- magnetic flux density

[SSC. (JE)-2013]

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

- 1.414
- 0.9
- 1.732
- 17.32

[SSC. (JE)-2013]

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

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

[SSC. (JE)-2012]

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

- Minimum at leading p.f.
- Minimum at lagging p.f.
- Maximum at unity p.f.
- Maximum at leading p.f.

[SSC. (JE)-2012]

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

[SSC. (JE)-2012]

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

[SSC. (JE)-2012]

37. Three resistance 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

[SSC. (JE)-2012]

38. A 120 V, 60 W incandescent lamp has to be operated from 220 V, 50 c/s, 1 phase ac supply. In order to do, this a circuit element has to be connected in series with the lamp. Which one of the following series elements is preferable?

- a) Pure capacitance
- b) Pure inductance or capacitance
- c) Resistance
- d) Pure inductance

[SSC. (JE)-2012]

39. 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) $\frac{RC}{L}$

[SSC. (JE)-2012]

40. 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 star connected

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

[SSC. (JE)-2012]

41. 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

[SSC. (JE)-2012]

42. 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

[SSC. (JE)-2012]

43. Which of the following is the best conductor of electricity?

- a) Warm water
- b) Salt water
- c) Cold water
- d) Distilled water

[SSC. (JE)-2012]

44. SI unit of Electrical Energy is

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

[SSC. (JE)-2012]

45. 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

[SSC. (JE)-2012]

46. 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

[SSC. (JE)-2012]

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

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

[SSC. (JE)-2012]

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

- a) Decreases
- b) Increases rapidly
- c) Increases slowly
- d) Does not change

[SSC. (JE)-2012]

49. In a balanced 3-phase system, the current coil of a wattmeter is inserted in line 1 and the potential coil across 2 and 3. If the wattmeter reads 100, the reactive power drawn by the 3-phase load is

- a) 173.2 VAR b) 50 VAR
- c) 100 VAR d) 141.4 VAR

[SSC. (JE)-2012]

50. 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

[SSC. (JE)-2012]