Answer Key :EE

Type: EE

1) A sinusoidal voltage v(t)=50sin(100πt) is applied to a 10 mH inductor. What is the peak value of the current flowing through the inductor?

Options:

- 1.0.159 A
- 2.0.318 A
- 3.1.59 A
- 4.3.18 A

Correct Option: 2

Type: EE

2) In an op-amp, ideal input impedance is:

Options:

- 1.Zero
- 2.Infinite
- 3.Unity
- 4.100 Ω

Correct Option: 2

Type: EE

3) A signal x(t) is band-limited to 5 kHz. What is the minimum sampling frequency required to avoid aliasing?

Options:

- 1.2.5 kHz
- 2.5 kHz
- 3.10 kHz
- 4.15 kHz

Correct Option: 3

Type: EE

4) Gain margin and phase margin indicate:

Options:

- 1.Power quality
- 2.Stability of system
- 3.Efficiency
- 4.Voltage drop

Correct Option: 2

Type: EE

5) The Laplace transform of x(t)=e^−2t u(t) is

Options:

- 1.1/S?2
- 2.1/S+2
- 3.1/S2+4
- 4.S/S+2

Correct Option: 2

Type: EE

6) The rotor frequency of a 3-phase induction motor operating at a slip of 4% with a supply frequency of 50 Hz is

Options:

- 1.2 Hz
- 2.0.5 Hz
- 3.4 Hz
- 4.10 Hz

Correct Option: 1

Type: EE

7) In a Transformer, hysteresis loss depends on

Options:

- 1.Supply frequency
- 2.Load current
- 3.Flux density and frequency
- 4.Winding resistance

Correct Option: 3

Type: EE

8) An auto-transformer has a voltage ratio of 400/200. The power transferred inductively is 2 kW. What is the total kVA of the auto-transformer?

Options:

- 1.6 kVA
- 2.2.5 kVA
- 3.8 kVA
- 4.4 kVA

Correct Option: 4

Type: EE

9) A three-phase synchronous motor draws 200A from the line at unity power factor at rated load. Considering the same line voltage and load, the line current at a power factor of 0.5 leading is

Options:

- 1.200 A
- 2.100 A
- 3.400 A
- 4.300 A

Correct Option: 3

Type: EE

10) The DC motor, which can provide zero speed regulation at full load without any controller is

Options:

- 1.Series
- 2.Shunt
- 3.Cumulative compound
- 4.Differential compound

Correct Option: 4

Type: EE

11) A generator is rated at 500 MVA, 11 kV with a reactance of 25%. If the base values are 100 MVA and 11 kV, what is the per-unit reactance of the generator on the new base?

Options:

- 1.0.05
- 2.0.2
- 3.0.25
- 4.0.5

Correct Option: 1

Type: EE

12) In a load flow study using the Newton-Raphson method, the size of the Jacobian matrix for a power system with N×N buses is

Options:

- 1.N×N
- 2.2N×2N
- 3.2(N−1) ×2(N−1)
- 4.(N−1) ×(N−1)

Correct Option: 3

Type: EE

13) A 50 Hz transmission line has a reactance of 0.5 Ω per phase. If the sending-end and receiving-end voltages are both 220 kV, what is the steady-state stability limit?

Options:

- 1.968 MW
- 2.1050 MW
- 3.1220 MW
- 4.880 MW

Correct Option: 1

Type: EE

14) The power factor of a 10 kW load is improved from 0.6 to 0.9 by adding a capacitor. What is the reactive power supplied by the capacitor?

Options:

- 1.3.5 kVAR
- 2.5.2 kVAR
- 3.6.8 kVAR
- 4.8.49 kVAR

Correct Option: 4

Type: EE

15) The most suitable instrument for measuring very low resistance is

Options:

- 1.Ohmmeter
- 2.Megger
- 3.Potentiometer
- 4.Kelvin's double bridge

Correct Option: 4

Type: EE

16) Moving iron instrument works on:

Options:

- 1.Heating effect
- 2.Electrostatic effect
- 3.Magnetic effect
- 4.Chemical effect

Correct Option: 3

Type: EE

17) The Boolean expression A+A'B simplifies to

Options:

- 1.A + B
- 2.A'B
- 3.AB
- 4.A

Correct Option: 1

Type: EE

18) A series RL circuit is supplied by a DC voltage source of 100 V. The resistance is 10 ? and inductance is 2 H. The time constant of the circuit is:

Options:

- 1.0.1 s
- 2.0.2 s
- 3.2 s
- 4.5 s

Correct Option: 2

Type: EE

19) A 50 Hz, 6-pole induction motor runs at 960 rpm. Its slip is:

Options:

- 1.0.02
- 2.0.04
- 3.0.06
- 4.0.08

Correct Option: 2

Type: EE

20) For a pure inductive AC circuit:

Options:

- 1.Current lags voltage by 90°
- 2.Average power consumed is zero
- 3.Power factor is unity
- 4.Reactive power exists

Correct Option: 1

Type: EE

21) Permanent Magnet Moving Coil (PMMC) instruments are

Options:

- 1.Suitable for AC measurement
- 2.Suitable for DC measurement
- 3.Suitable for both AC and DC measurement
- 4.Used to measure energy

Correct Option: 2

Type: EE

22) The constant of an energy meter is 600 revolutions per kWh. If the meter makes 300 revolutions in 10 minutes, what is the load in kW?

Options:

- 1.0.5 kW
- 2.1 kW
- 3.2 kW
- 4.3 kW

Correct Option: 4

Type: EE

23) The Boolean expression A+A'B simplifies to

Options:

- 1.A + B
- 2.A'B
- 3.AB
- 4.A

Correct Option: 1

Type: EE

24) In an ideal operational amplifier, the input impedance is

Options:

- 1.Very low
- 2.Very high
- 3.Zero
- 4.Finite

Correct Option: 2

Type: EE

25) A 10-bit ADC operates with a clock frequency of 1 MHz What is the conversion time for a successive approximation ADC?

Options:

- 1.10 µs
- 2.1 µs
- 3.100 µs
- 4.1024 µs

Correct Option: 1

Type: EE

26) For a system with a transfer function G(s)=10/s(s+1), the slope of the Bode magnitude plot at high frequencies is:

Options:

- 1.−20 dB/decade
- 2.−40 dB/decade
- 3.−60 dB/decade
- 4.−80 dB/decade

Correct Option: 2

Type: EE

27) The integral action in PID controller

Options:

- 1.Reduces steady-state error
- 2.Reduces oscillations
- 3.Reduces rise time
- 4.Increases bandwidth

Correct Option: 1

Type: EE

28) A three-phase fully-controlled rectifier is connected to a 415 V (line-to-line) AC supply. If the firing angle is 60?, what is the average output DC voltage? Assume continuous conduction

Options:

- 1.354 V
- 2.323 V
- 3.298 V
- 4.281 V

Correct Option: 2

Type: EE

29) A boost converter is operating with an input voltage of 12 V, output voltage of 48 V, load resistance of 96 ?, and a switching frequency of 25 kHz. If the converter has an efficiency of 90%, what is the input current?

Options:

- 1.4.16 A
- 2.3.75 A
- 3.2.22 A
- 4.5.17 A

Correct Option: 3

Type: EE

30) The purpose of a snubber circuit in power electronic devices is to

Options:

- 1.Reduce the switching losses
- 2.Increase the efficiency
- 3.Ensure zero voltage switching
- 4.Protect against high dv/dt and di/dt

Correct Option: 4