

UNIT 2 - D.C MACHINES & A.C MACHINES

	I	V
Resistive	0	0
Inductive	$-\frac{\pi}{2}$ 0	0 $+\frac{\pi}{2}$
Capacitive	$+\frac{\pi}{2}$ 0	0 $-\frac{\pi}{2}$

→ base

1. Power factor of Zero lagging indicates

- a) Purely resistive element
- c) combination of both (A) and (B)
- b) Purely inductive element
- d) Purely capacitive element

Answer: B

2. No load speed of which of the following motor will be highest

- a) Shunt motor
- c) Differentially compound motor
- b) Cumulatively compound motor
- d) Series motor

Answer: D

3. Which of the following is the most economical method of starting a single phase motor?

- a) Resistance start method
- c) Capacitance start method
- b) Inductance start method
- d) Split phase method

Answer: C

4. Material used for the construction of transformer core is usually

- a) wood
- b) copper
- c) Aluminum
- d) Silicon steel

Answer: D

5. The power factor in resistive circuit is

- a) 0.6pf lagging
- b) 0.8pf lagging
- c) 0.8pf lagging
- d) 1

Answer: D

6. DC generator works on the principle of

- a) Fleming's right hand rule
- c) Faraday's law
- b) Fleming's left hand rule
- d) Lenz's law

Answer: A

7. Two windings of a transformer are -----coupled

- A) Magnetically
- c) Both electrically and magnetically
- b) Electrically
- d) Resistively

Answer: A

8. The synchronous speed of a 4 pole induction motor for 50Hz power supply is -----rpm.

- a) 1500
- b) 1000
- c) 750
- d) 1440

Answer: A

9. Power factor is the ratio of

- a) Impedance to resistance
- c) Resistance to impedance
- b) Resistance to reactance
- d) Reactance to impedance

Answer: C

10. Form factor is the ratio of

- a) Maximum to RMS Value
- c) RMS to average value
- b) Maximum to average value
- d) RMS to maximum value

Answer: C

11. The unit of magnetic flux density is

- a) Henry/meter
- b) Tesla
- c) Amp/meter
- d) volt/meter

Answer: B

12. The flux is analogous to

- A) Voltage in electric circuit
- c) Power in electric circuit
- b) Current in electric circuit
- d) Resistance in electric circuit

Answer: B

13. Which motor is constant speed motor?

- a) DC series motor
- b) DC shunt motor
- c) DC compound motor

d) Induction motor

Answer: B

14. The primary winding of a transformer has 110V across it. What is the secondary voltage if the turns ratio is 8?

a) 8.8V

b) 88V

c) 880V

d) 8800V

Answer: C

$$\frac{V_2}{V_1} = \frac{N_2}{N_1} \Rightarrow \frac{V_2}{110} = 8 \Rightarrow V_2 = 880 \text{ V}$$

15. A magnetizing force of 8000 A/m is applied to a circular magnetic circuit of mean diameter 30 cm by passing a current through a coil wound on the circuit is 750 turns. If the coil is uniformly wound, calculate the current flow in the circuit.

a) 10.05 A

b) 9.8 A

c) 11 A

d) 12 A

Answer: A

16. What will be the magnetic potential difference across the air gap of 2 cm length in magnetic field of 200 AT/m?

a) 2 AT

b) 4 AT

c) 6 AT

d) 10 AT

Answer: B

17. A single-winding single-phase motor has

a) Low starting torque

c) High starting torque

b) zero starting torque

d) Starting torque equal to full-load torque.

Answer: B

18. A differentially compounded motor under high-over-load conditions behaves like a/an

a) Shunt motor

b) Series motor

c) Cumulative compound motor

d) Synchronous motor

Answer: B

1. An electric motor with constant power will have a torque speed characteristic in the form of a

- a) Straight line through the origin
- c) Circle about the origin
- b) Straight line parallel to the speed axis
- d) Rectangular hyperbola

Answer: B

2. If load current and flux of DC motor are held constant and voltage applied across its armature is increased by 5%, then speed of motor will

- a) Increase by about 5%
- b) Reduce by about 5%
- c) Remain unaltered
- d) Depends on other factors

Answer: A

3. The slip of an induction motor normally does not depend on

- a) Rotor speed
- b) Synchronous speed
- c) Shaft torque
- d) Core-loss component

Answer: D

4. A 4-Point starter is used to start and control the speed of a

- a) DC shunt motor with armature resistance control
- c) DC series motor
- b) DC shunt motor with field weakening control
- d) DC compound motor

Answer: A

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

- a) Series
- b) Shunt
- c) Cumulative compound
- d) Differential compound

Answer: B

6. A Solenoid is wound with a coil of 100 turns. The coil is of length 50cm and is carrying a current of 2A. Determine the magnetic field strength at the line of the solenoid.

- a) 450 AT/m
- b) 400 AT/m
- c) 500 AT/m
- d) 600 AT/m

Answer: B

7. If the cross-sectional area of a magnetic field increases, but the flux remains the same, the flux density

- a) Increases

- b)Decreases
- c)Remains the same
- d)Doubles

Answer: B

8.What is the reluctance of a material that has a length of 0.07 m, a cross-sectional area of 0.014 m², and a permeability of 4,500 Wb/At × m?

- a)1111 At/Wb
- b)111 At/Wb
- c)11 At/Wb
- d)1 At/Wb

Answer: A

9.A 47 Ohm resistor and a capacitor with a capacitive reactance of 120 are in series across an ac source. What is the circuit impedance, Z

- a)126ohm
- b)127ohm
- c)128ohm
- d)129ohm

Answer: D

10.The ability of a material to remain magnetized after removal of the magnetizing force is known as

- a)Permeability
- b)Reluctance
- c)Retentivity
- d)Hysteresis

Answer: C

11.The induced voltage across a stationary conductor in a stationary magnetic field is

- a)Zero
- b)Increased
- c)Decreased
- d)Reversed in polarity

Answer: A

12.A DC generator is rotated at 50 revolutions/sec .how many times does the dc output voltage reach maximum in each second?

- a)50
- b)100
- c)150
- d)3000

Answer: B

1. In a series RC circuit, 12V is measured across the resistor and 15V is measured across the capacitor. The source voltage is

- a) 3V
- b) 27V
- c) 19.2V
- d) 12V

Answer: C

2. Each phase of a 3-phase star connected alternator produces a voltage of 11000V and current of 1000A at power factor 0.9. Find line voltage, line current and total capacity of the alternator.

- a) $V_L = 19053V$, $I_L = 1000A$, Capacity = 29.7MW
- c) $V_L = 19053V$, $I_L = 1000A$, Capacity = 29.7MW
- b) $V_L = 2000V$, $I_L = 1500A$, Capacity = 25MW
- d) $V_L = 2500V$, $I_L = 500A$, Capacity = 35MW

Answer: A

3. A DC motor takes an armature current of 110A at 480V. The armature circuit resistance is 2ohm. The machine has 6 poles and the armature is lap connected with 864 conductors. The flux per pole is 0.05wb. Calculate speed and torque developed by the armature.

- a) $N = 630\text{rpm}$ & $T = 750\text{N-m}$
- c) $N = 636\text{rpm}$ & $T = 756\text{N-m}$
- b) $N = 635\text{rpm}$ & $T = 786\text{N-m}$
- d) $N = 536\text{rpm}$ & $T = 856\text{N-m}$

Answer: C

4. The regulation of dc generator on full load is about

- a) 15 to 20%
- b) 20 to 25%
- c) 10 to 15%
- d) 5 to 10%

Answer: D

5. For a single phase capacitor start induction motor which of the following statements is invalid?

- a) The capacitor is used for power factor improvement
- c) The direction of rotation cannot be changed
- b) The direction of rotation can be changed by reversing the main winding terminals
- d) The direction of rotation can be changed by interchanging the supply terminals

Answer: B

6. A DC series motor has linear magnetization and negligible armature resistance, the motor speed is

- a) Directly proportional to \sqrt{T}
- b) Inversely proportional to \sqrt{T}
- c) Directly proportional to T
- d) Inversely proportional to \sqrt{T}

Answer: B

The peak factor of an alternating voltage is _____

- A. $V_{\text{rms}}/V_{\text{avg}}$
- B. $V_{\text{m}}/V_{\text{rms}}$
- C. $V_{\text{avg}}/V_{\text{rms}}$
- D. $V_{\text{rms}}/V_{\text{m}}$

ANSWER: B

Angular displacement between the positive maximum values of two alternating quantities having same frequency is called

- A. phase difference
- B. phase velocity
- C. frequency
- D. waveform

ANSWER: A

To prevent saturation in a magnetic circuit, _____ can be usually inserted.

- A. air gap
- Magnetic motive force
- C. magnetic field
- D. flux density

ANSWER: A

The function of brushes in a DC generator is

- A. To increase the voltage
- B. To increase the current
- C. To bring the power developed to the load
- D. To provide flux density in air gap

ANSWER: C

The material used for yoke of a dc machines is iron to perform

- A. To provide current path
- B. To provide flux path
- C. To provide mechanical support
- D. To provide both current and flux path.

ANSWER: B

The power rating of the primary and secondary windings of a transformer is ----

- A. same
- B. different
- C. has no power rating

D. half of the power rating.

ANSWER: A

The armature torque of a dc shunt motor depends on

- A. Load on the shaft
- B. Armature current
- C. Field current
- D. Both field and armature current

ANSWER: B

Why the single phase induction motor is not self starting motor ?

- A. The magnitude of the flux produced in the stator is low
- B. No voltage is induced in the rotor circuit
- C. There is no relative motion between the stator and rotor magnetic fields
- D. three- phase flux produced in the stator winding

ANSWER: C

What will happen when the phase sequence of three phase induction motor is changed in stator side?

- A. Motor does not run
- B. Slip changes
- C. Direction of rotation is reversed
- D. Motor gets heated

ANSWER: C

Which of the following is a characteristic of a capacitor start motor?

- A. Has a high starting torque
- B. Can be manufactured up to 5 kW
- C. Low starting torque
- D. It includes high starting torque, good starting and running characteristics.

ANSWER: D

A wave completes one cycle in 10 m sec, its frequency will be _____ Hz

- A. 1
- B. 50
- C. 100
- D. 10

ANSWER: C

The average value of sine wave with the peak value of 400 V is _____ V

- A. 1127.4

- B. 254.6
 - C. 1282.8
 - D. 1200
- ANSWER: B

If an R-L load is drawing 8 kW at a power factor of 0.8 (lagging) from a single-phase A.C. supply, find the apparent power drawn by the load.

- A. 10 VA
 - B. 6.4 VA
 - C. 6.4 kVA
 - D. 10 Kva
- ANSWER: D

Find the synchronous speed of an 8-pole 60 Hz AC motor in revolution per minute.

- A. 450
 - B. 900
 - C. 750
 - D. 1500
- ANSWER: B

If the speed of the rotating magnetic field is N_s rpm and that of the induction motor is N rpm, which of the following is valid?

- A. $N > N_s$
 - B. $N = N_s$
 - C. $N < N_s$
 - D. N is independent of N_s
- ANSWER: C

For an alternating current with the frequency 50 Hz, the reactance of the capacitor is 10 ohms. When the frequency is increased to 60 Hz, the reactance of the capacitor becomes _____ ohms.

- A. 7.56
 - B. 9.44
 - C. 8.33
 - D. 6.83
- ANSWER: C

UNIT 3 - ELECTRONIC DEVICES

1.The function of choke and starter in a fluorescent lamp circuit is to

- a)Reduce the power consumed by the fluorescent lamp
- b>Create a high voltage across the tube during starting
- c)Help to draw very high current during starting
- d)Improve the power factor of the fluorescent lamp circuit

Answer: B

2. Moving coil instruments can be used on

- a)DC only
- b)sinusoidal AC only
- c)All AC waveforms
- d)AC and DC both

Answer: A

3.PMMC Instrument are used for -----quantity measurement

- a)AC
- b)Magnetic
- c)DC
- d)Both AC and DC

Answer: C

4.Moving Parts of instruments are supported in

- a)Bush bearings
- b)Ball bearings
- c)Roller Bearings
- d)Jewelled bearings

Answer: D

5.A single lamp controlled by two -way switches at two places is called

- a)Stair case wiring
- b)Corridor wiring
- c)Cleat wiring
- d)Batter wiring

Answer: A

6.In a moving coil ammeter,the deflecting torque is directly proportional to the

- a)Square of the current to be measured
- b)Current to be measured
- c)Twice the current to be measured
- d)Square root of the current to be measured

Answer: B

7. Which can not reduce the earth resistance?

- a) Pouring water in the earth pit
- c) Increasing the depth of the earth pit
- b) Decreasing plate area
- d) connecting electrodes in parallel

Answer: B

8. The earth plate made up of

- a) copper
- b) aluminium
- c) lead
- d) iron

Answer: A

9. Good earthing is that which gives

- a) very low resistance
- b) High resistance
- c) Equal resistance
- d) zero resistance

Answer: A

10. The high torque to weight ratio in an analog indicating instrument indicates

- a) High friction loss
- c) Nothing as regards friction loss
- b) Low friction loss
- d) Copper loss

Answer: B

11. GaAs, LED emits radiation in the

- (a) UV region
- (b) Blue color
- (c) visible region
- (d) infra-red region

Answer: D

12. The ripple factor of bridge rectifier is

- (a) 0.482 (b) 0.812 (c) 1.11 (d) 1.21

Answer: A

13. The basic purpose of filter is to

- (a) minimize variations in a.c. input signal (b) suppress harmonics in rectified output
- (c) removes ripples from rectifier output (d) stabilize dc output voltage

Answer: C

14. If V_m is the peak value of an applied voltage in half wave rectifier with a large capacitor across load, then PIV is

- (a) $V_m/2$ (b) V_m (c) $2V_m$ (d) $1.414V_m$

Answer: B

15. Junction breakdown of a PN junction occurs

- (a) with forward bias (b) with reverse bias
(c) because of manufacturing defect (d) None of above

Answer: B

16. In PN junction diode dynamic conductance is directly proportional to

- (a) the applied voltage (b) temperature
(c) the current (d) the thermal voltage

Answer: C

17. In a full wave rectifier, the current in each of the diodes flows for

- (a) complete cycle of the input signal
(b) half cycle of the input signal
(c) less than half of the input signal
(d) None of above

Answer: A

18. When the PN junction diode is forward biased

- (a) the only current is hole current
(b) the only current is electron current
(c) the only current is produced by majority carriers
(d) the current is produced by both holes and electrons

Answer: C

1. For 1N4736 Zener diode has $Z_Z=3.5\ \Omega$. The datasheet gives $V_{zt}=6.8V$ at $I_{zt}=37mA$, What is voltage across zener terminals when the current is $50mA$?

- (a) $6.85V$ (b) $7.85V$ (c) $8.85V$ (d) $9.95V$

Answer: A

2. A Si PN junction has a reverse saturation current of $I_0=30nA$ at room temperature, the junction forward voltage required to produce current of $0.1mA$ is

- (a) $0.42V$ (b) $0.55V$ (c) $0.80V$ (d) $0.49V$

Answer: A

3. The value of reverse bias resistance for an ideal diode is _____

- (a) infinity (b) 0 (c) one (d) none of the above

Answer: A

4. Semiconductor material have _____ temp. coefficient

- (a) Positive (b) Negative (c) Both positive and negative (d) None

Answer: B

5. A zener diode works on the principle of
- (a) tunneling of charge carriers across junction
 - (b) thermionic emission
 - (c) diffusion of charge carriers across junction
 - (d) hopping of charge carriers across junction

Answer: C

6. Which one of the following types of indicating instrument is an electrometer?

- a) Electrodynamometer
- b) PMMC
- c) Electrostatic
- d) Moving iron

Answer: C

7. In cleat wiring the porcelain are very easy to erect and fixed at a distance of

- a) 4.5 cm to 15 cm apart
- b) 5.5 cm to 20 cm apart
- c) 6.5 cm to 25 cm apart
- d) 7.5 cm to 30 cm apart

Answer: A

8. In fluorescent lamp the light output is ---- lumens per watt.

- a) 70
- b) 80
- c) 90
- d) 95

Answer: A

9. The device used in series with the line wire is

- a) C.B
- b) isolator
- c) Fuse
- d) Both C.B and isolator

Answer: C

10. The earth's potential is always

- a) Zero
- b) one
- c) Lesser than one
- d) Greater than one

Answer: A

11. If the input supply frequency is 50Hz, the output supply frequency of a bridge wave rectifier is _____ Hz

- (a) 100 (b) 75 (c) 50 (d) 25

Answer: A

12. A half wave rectifier has an input voltage of 240 V rms if the step down transformer has turns ratio of 8:1, what is the load voltage?

- (a) 27.5v (b) 86.5v (c) 30v (d) 42.5V

Answer: D

1. Reverse saturation current in silicon PN junction diode nearly doubles for every

- (a) 20°C rise in temperature (b) 50°C rise in temperature
(c) 60°C rise in temperature (d) 10°C rise in temperature

Answer: D

2. If, by mistake ac source in a bridge rectifier is connected across the dc terminals it will burn out and hence short _____ diodes

- (a) One (b) Two (c) Three (d) Four

Answer: D

3. A Voltage of 200V produces a deflection of 90° in PMMC spring controlled instrument. If the same instruments provided with gravity control, what would be the deflection?

- a) 90°
b) 45°
c) 64.2°
d) 98°

Answer: B

4. In plate earthing the earth plate made up of copper size

- a) 60cm*60cm*3.18mm
b) 70cm*80cm*3.18mm
c) 80cm*65cm*3.18mm
d) 90cm*60cm*3.18mm

Answer: A

5. A moving coil instrument gives a full scale deflection of 20mA. When a potential difference of 50mV is applied. Calculate the series resistance to measure 500V on scale?

- a) 2000ohm
b) 3000ohm
c) 3500ohm
d) 24997.5ohm

Answer: D

6. The applied input ac power to a half wave rectifier is 100 watts. The d.c output power obtained is 40 watts. What is the rectification efficiency?

(a)10% (b)20% (c)30% (d)40%

Answer: D

Zener diode is mainly employed in

A. producing oscillations in an oscillator

B. amplification

C. stabilization

D. rectification

ANSWER: C

An NPN transistor conducts during

A. collector is positive and emitter is at same potential as the base

B. both collector and emitter are negative with respect to base

C. both collector and emitter are positive with respect to the base

D. collector is positive and emitter is negative with respect to the base

ANSWER: D

The diode is used in

A. Uncontrolled rectifiers

B. transformers

C. Machines

D. Controlled rectifiers

ANSWER: A

The number of 2-way switches used in staircase wiring

A. 2

B. 3

C. 4

D. 1

ANSWER: A

The voltage controlled semiconductor device is identified as

A. Zener diode

B. BJT

C. PN diode

D. MOSFET

ANSWER: D

An analog circuit which denotes the operation of clipper is equivalent to

- A. Full wave rectifier
- B. Bridge rectifier
- C. Half wave rectifier
- D. Centre tapped rectifier

ANSWER: C

The level of cutting down the voltage in clipper circuit is based on

- A. Control voltage
- B. Reference voltage
- C. AC supply voltage
- D. Filter

ANSWER: B

An un-controlled semiconductor device is

- A. BJT
- B. JFET
- C. PN junction diode
- D. MOSFET

ANSWER: C

Ground wire or Earth wire is made up of

- A. Copper
- B. Iron
- C. Aluminium
- D. Galvanized steel

ANSWER: D

An instrument which is used only for the direct current supply will be

- A. Moving iron attraction type
- B. Moving Iron repulsion type
- C. Permanent magnet type
- D. Hotwire type

ANSWER: C

The width of depletion layer in a forward biased PN junction diode

- A. Increases
- B. decreases
- C. remains constant
- D. first increases then decreases

ANSWER: B

The heavily doped region to produce large majority carriers in a transistor is

- A. emitter
- B. base
- C. collector
- D. depending upon the type of transistor

ANSWER: A

Which among the following is a current controlled semiconductor device?

- A. BJT
- B. JFET
- C. PN junction diode
- D. MOSFET

ANSWER: A

Efficiency of bridge type rectifier is always _____ times as that of half wave rectifier.

- A. Equal
- B. Double
- C. Half
- D. Four times

ANSWER: B

Earthing is an essential protection to provide against

- A. Danger of electric shock
- B. Overloading
- C. Voltage fluctuation
- D. High temperature of the conductors

ANSWER: A

The cheapest wiring among all types of internal wiring used for domestic installations is

- A. Cleat wiring
- B. CTS/RTS wiring
- C. Metal wiring
- D. PVC conduit wiring

ANSWER: A

A half wave rectifier possesses a peak voltage of 225V. The average output voltage found as

- A. 71.6
- B. 143.3
- C. 112.5
- D. 159.1

ANSWER: A

The supply voltage of a full wave rectifier is $115 \sin(314t + \phi)$. The output ripple frequency in hertz is

- A. 50

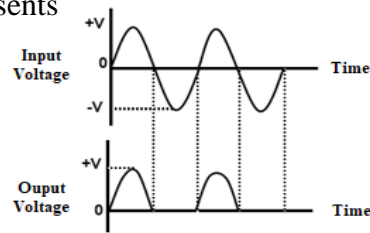
- B. 200
- C. 100
- D. 25

ANSWER: C

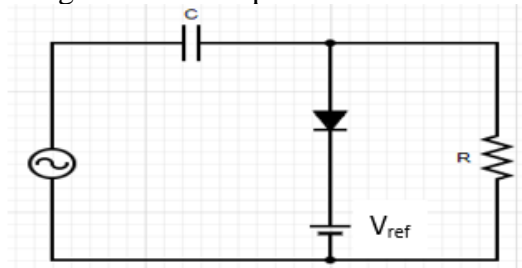
The shown waveform represents

- A. Positive clipper
- B. Negative clipper
- C. Positive clamper
- D. Negative clamper

ANSWER: B



The given circuit represents



- A. Negative Clamper with Positive V_{ref}
- B. Negative Clamper with Negative V_{ref}
- C. Positive Clamper with Positive V_{ref}
- D. Positive Clamper with Negative V_{ref}

ANSWER: A