

UNIT-V

AC Distribution

1. AC distribution systems are used primarily for:

- A) Power generation
- B) Power transmission only
- C) Supplying power to consumers
- D) Voltage regulation only

Answer: C

2. The most common distribution system used for domestic consumers is:

- A) Single-phase 2-wire
- B) Three-phase 3-wire
- C) HVDC system
- D) Double-circuit transmission

Answer: A

3. A three-phase four-wire system provides:

- A) Three phase voltages only
- B) Single-phase and three-phase supplies
- C) DC supply
- D) Reactive power only

Answer: B

4. In a three-phase four-wire system, the fourth wire is:

- A) Earth wire
- B) Neutral wire
- C) Guard wire
- D) Pilot wire

Answer: B

5. Which distribution system is generally used for industrial loads?

- A) Single-phase 2-wire
- B) Three-phase 3-wire
- C) DC two-wire
- D) Single-wire earth return

Answer: B

6. The purpose of a bus bar in a substation is to:

- A) Generate power
- B) Store energy
- C) Collect and distribute power
- D) Measure voltage

Answer: C

7. A radial distribution system has:

- A) Two supply points
- B) Multiple interconnected feeders
- C) One supply path to the load

D) Ring structure

Answer: C

8. Voltage drop in a distributor mainly depends on:

A) Conductor impedance and load current

B) Frequency only

C) Generator speed only

D) Transformer rating only

Answer: A

9. The unit of voltage drop is:

A) Ampere

B) Ohm

C) Volt

D) Watt

Answer: C

10. In AC distributors, voltage drop is affected by:

A) Resistance only

B) Reactance only

C) Resistance and Reactance

D) Capacitance only

Answer: C

11. A good distribution system should have:

A) High voltage drop

B) Low voltage regulation

C) Minimum voltage drop

D) Maximum losses

Answer: C

12. The preferred location for a distribution substation is:

A) Far from load center

B) At the load center

C) Near generating station only

D) On hilltops only

Answer: B

13. Which factor is important in selecting a substation site?

A) Accessibility

B) Future expansion

C) Availability of land

D) All of the above

Answer: D

14. The voltage drop due to resistance is proportional to:

A) $I \sin \phi$

B) $I \cos \phi$

C) Voltage only

D) Frequency only

Answer: B

15. The voltage drop due to reactance is proportional to:

- A) $I \sin \phi$
- B) $I \cos \phi$
- C) $I^2 R$
- D) Voltage

Answer: A

16. In a balanced 3-phase system, the neutral current is:

- A) Maximum
- B) Equal to phase current
- C) Zero
- D) Twice the phase current

Answer: C

17. Which system is most economical for distributing large power?

- A) Single-phase 2-wire
- B) Three-phase 3-wire
- C) DC two-wire
- D) Single-wire system

Answer: B

18. Power factor referred to receiving-end voltage means:

- A) Power factor measured at source
- B) Power factor measured at receiving end
- C) Unity power factor only
- D) Lagging power factor only

Answer: B

19. Voltage regulation improves when:

- A) Voltage drop increases
- B) Voltage drop decreases
- C) Current increases greatly
- D) Power factor decreases

Answer: B

20. The primary objective of voltage-drop calculations in distributors is:

- A) Determine frequency
- B) Ensure consumer voltage remains within limits
- C) Calculate transformer efficiency
- D) Determine generator speed

Answer: B

Fill in the Blanks

1. AC distribution systems deliver electrical power to the _____.

Answer: Consumers

2. The most common domestic distribution system is _____ phase two-wire.

Answer: Single

3. A three-phase four-wire system contains three phase conductors and one _____ conductor.
Answer: Neutral
4. Industrial consumers are generally supplied through a _____ phase system.
Answer: Three
5. The conductor used as a common return path is called the _____.
Answer: Neutral
6. A bus bar is used to collect and _____ electrical power.
Answer: Distribute
7. The voltage drop in a distributor depends upon load current and conductor _____.
Answer: Impedance
8. The resistance component of voltage drop is proportional to $I \cos \phi$.
Answer: $\cos$
9. The reactance component of voltage drop is proportional to $I \sin \phi$.
Answer: $\sin$
10. Voltage drop is measured in _____.
Answer: Volts
11. A radial distribution system has only one _____ path.
Answer: Supply
12. The ideal location of a distribution substation is near the _____ center.
Answer: Load
13. Good accessibility is an important factor in _____ selection.
Answer: Substation
14. Future _____ should be considered while selecting a substation site.
Answer: Expansion
15. In a balanced three-phase system, neutral current is _____.
Answer: Zero
16. A lower voltage drop results in better voltage _____.
Answer: Regulation
17. The power factor of a load may be lagging or _____.
Answer: Leading
18. Voltage-drop calculations help maintain consumer voltage within permissible _____.
Answer: Limits
19. In AC distributors, both resistance and _____ affect voltage drop.
Answer: Reactance
20. Three-phase systems are more _____ than single-phase systems for power distribution.
Answer: Economical

Numerical-Based MCQs (Voltage Drop Calculations)

21. In an AC distributor, the voltage drop expression is:
A) IR

- B) IX
- C) $I(R\cos\phi + X\sin\phi)$
- D) $I(R\sin\phi + X\cos\phi)$

Answer: C

22. For unity power factor load, voltage drop becomes:

- A) IX
- B) IR
- C) $I(R+X)$
- D) Zero

Answer: B

23. If $R = 2\ \Omega$, $X = 1\ \Omega$, $I = 10\text{ A}$, $\cos\phi = 0.8$, $\sin\phi = 0.6$, voltage drop is:

- A) 22 V
- B) 18 V
- C) 16 V
- D) 10 V

Answer: A

$$(10 \times (2 \times 0.8 + 1 \times 0.6)) = 22\text{ V}$$

24. At lagging power factor, the reactance term contributes:

- A) Negatively
- B) Positively
- C) Zero
- D) Independently

Answer: B

25. The voltage-drop calculation referred to receiving-end voltage uses the load power factor at the:

- A) Sending end
- B) Receiving end
- C) Midpoint
- D) Generator terminal

Answer: B