SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore-35

Department of ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

23EET103-Electric Circuits and Electron Devices
I B.Tech. CSE-IOT/ II SEMESTER

UNIT II : AC CIRCUITS

Topic : Problems with step by step solutions

Power in AC Circuits – Problem 1

- Problem:

Voltage = 240 V

Current = 8 A

Power factor = 0.75

Find the real power.

Solution:

  - Formula: $P = V \times I \times \cos\phi$
  - $P = 240 \times 8 \times 0.75$
  - $P = 1440$ W

Power in AC Circuits – Problem 2

- Problem:
  Voltage = 230 V
  Current = 6 A
  Power factor = 0.9

Find the real power.

Solution:

Formula: $P = V \times I \times \cos\phi$

$P = 230 \times 6 \times 0.9$

$P = 1242$ W

Power Factor – Problem 1

Problem:

Real Power = 600 W

Apparent Power = 750 VA

Find the power factor.

Solution:

- Formula: PF = Real Power / Apparent Power
- PF = 600 / 750
- PF = 0.8

Power Factor – Problem 2

Problem:

Real Power = 900 W

Apparent Power = 1200 VA

Find the power factor.

Solution:

- Formula: PF = P / S
- PF = 900 / 1200
- PF = 0.75

Three-Phase Power – Problem 1

Problem:

Line Voltage = 415 V

Line Current = 12 A

Power factor = 0.85

Find total power.

Solution:

- Formula: $P = \sqrt{3} \times V_L \times I_L \times \cos\phi$
- $P = 1.732 \times 415 \times 12 \times 0.85$
- $P \approx 7329$ W

Three-Phase Power – Problem 2

Problem:

Line Voltage = 400 V

Line Current = 15 A

Power factor = 0.9

Find total power.

Solution:

- Formula: $P = \sqrt{3} \times V_L \times I_L \times \cos\phi$
- $P = 1.732 \times 400 \times 15 \times 0.9$
- $P \approx 9353$ W

Three-Phase Power – Problem 2

Problem:

Line Voltage = 400 V

Line Current = 15 A

Power factor = 0.9

Find total power.

Solution:

- Formula: $P = \sqrt{3} \times V_L \times I_L \times \cos\phi$
- $P = 1.732 \times 400 \times 15 \times 0.9$
- $P \approx 9353$ W


Thank
you!