



# **SNS COLLEGE OF TECHNOLOGY**

(An Autonomous Institution)

Re-accredited by NAAC with 'A+' Grade

Approved by AICTE, New Delhi, Recognized by UGC & Affiliated by Anna University, Chennai  
Coimbatore-641035

## **DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**19EET301 / POWER ELECTRONICS AND DRIVES**

**III YEAR / V SEMESTER**

**UNIT – V : AC MOTOR DRIVES**



**ENERGY EFFICIENT  
DRIVE (V/F)**



# TOPIC OUTLINE

What we'll  
discuss?



Voltage Control AC Drive  
Energy Efficient Drive - V/F  
V/F closed loop control  
V/F – Assignment  
Evaluation

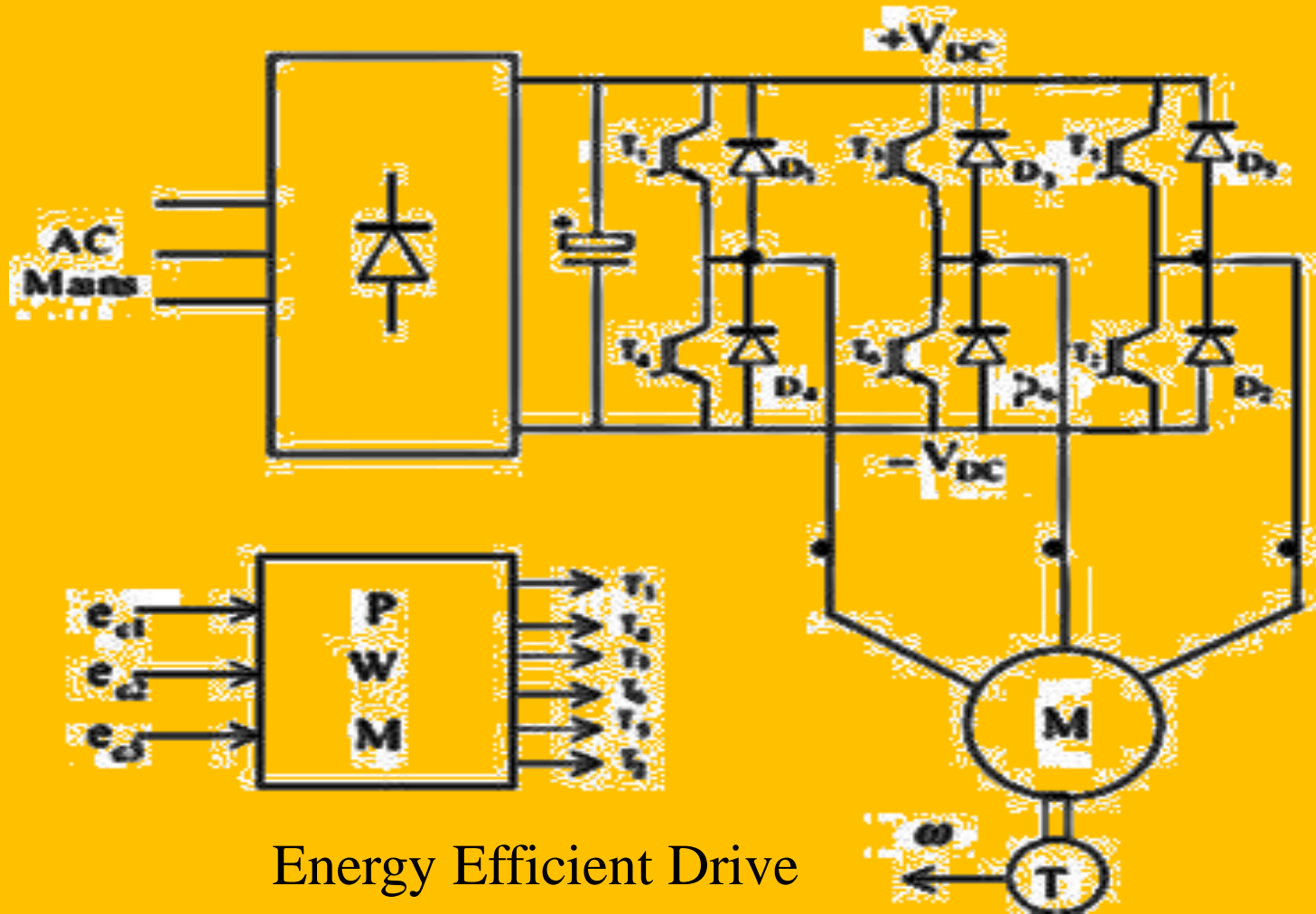


# ENERGY EFFICIENT DRIVE (V/F)

- **V:** Easily achieved by **stator voltage control**. But very low efficiencies at lower speeds.
- **R: Rotor resistance control.** But very low efficiencies at lower speeds.
- **F: Varying supply frequency.** But at low frequency - flux saturation and high frequency – poor performance.
- **V/F:** Keeping **v/f ratio** as constant - **Energy Efficient Drive** -  
Wide speed range and also improves the starting performance



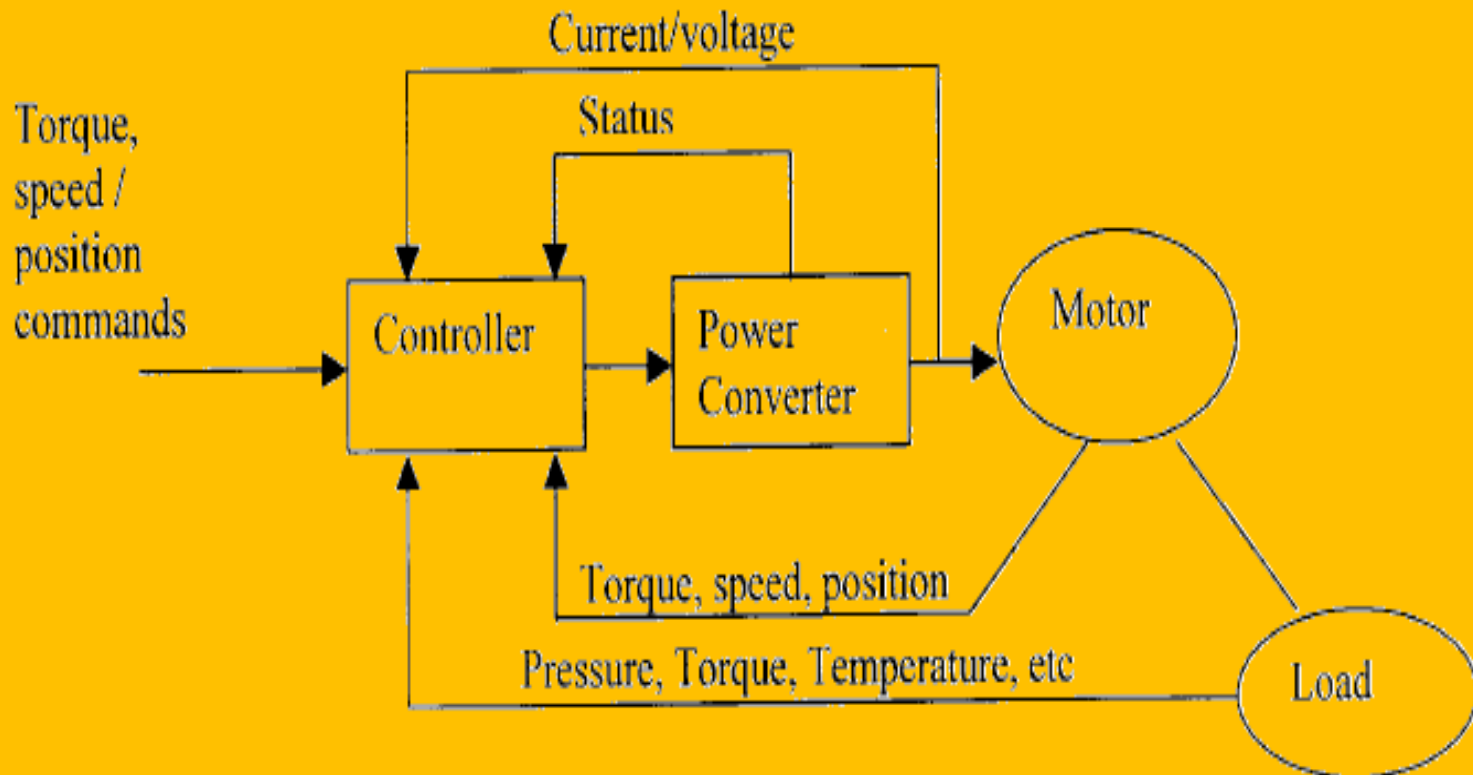
# ENERGY EFFICIENT DRIVE



Energy Efficient Drive



# V/F – CLOSED LOOP CONTROL





# V/F – VARIOUS ILLUSTRATION

## Assignment



**Draw Block Diagram for...?**

- 3 phase AC supply → Diode rectifier → DC Chopper  
→ Inverter → Induction Motor
- 3 phase AC supply → SCR converter → Inverter  
→ Induction Motor
- 3 phase AC supply → Cyclo-converter → Induction Motor
- DC supply → Inverter → Induction Motor
- Any other illustrations?



# EVALUATION

Draw Voltage Regulator circuit for.....

1. Single phase half regulator,
2. Single phase full regulator,
3. Three phase half regulator



Thanking You.