SNS COLLEGE OF TECHNOLOGY

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Coimbatore-641035

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

19EET301 / POWER ELECTRONICS AND DRIVES

III YEAR / V SEMESTER

UNIT – IV : DC DRIVES

SPEED CONTROL METHODS

TOPIC OUTLINE

What we'll discuss?

Basic Equations

Speed Control Methods

Constant: Torque / Power Operation

BASIC EQUATIONS / METHODS

The relation of speed, torque, back emf is

Back EMF , E_b : V - I_a R_a
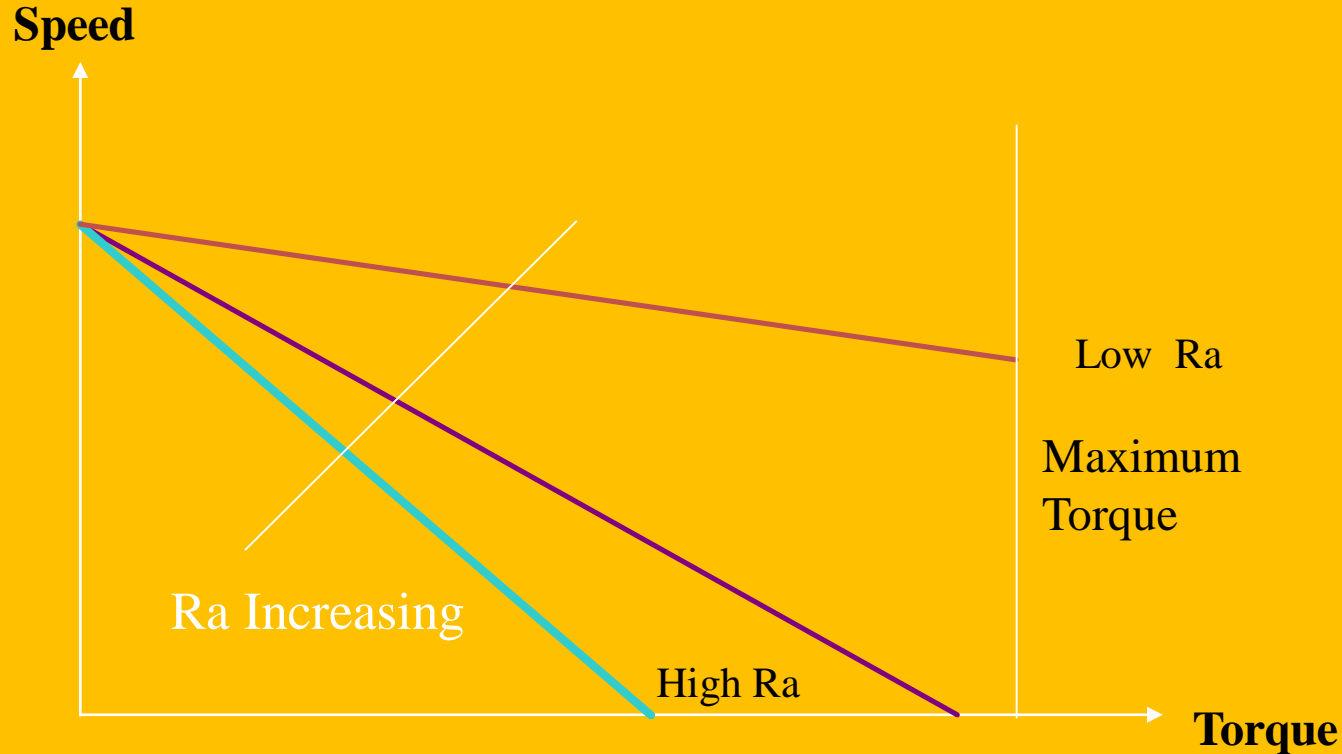
Speed, N : E_b / Φ

Torque , T : Φ I_a

The methods are:

1. Armature Resistance Method
2. Field Flux Method
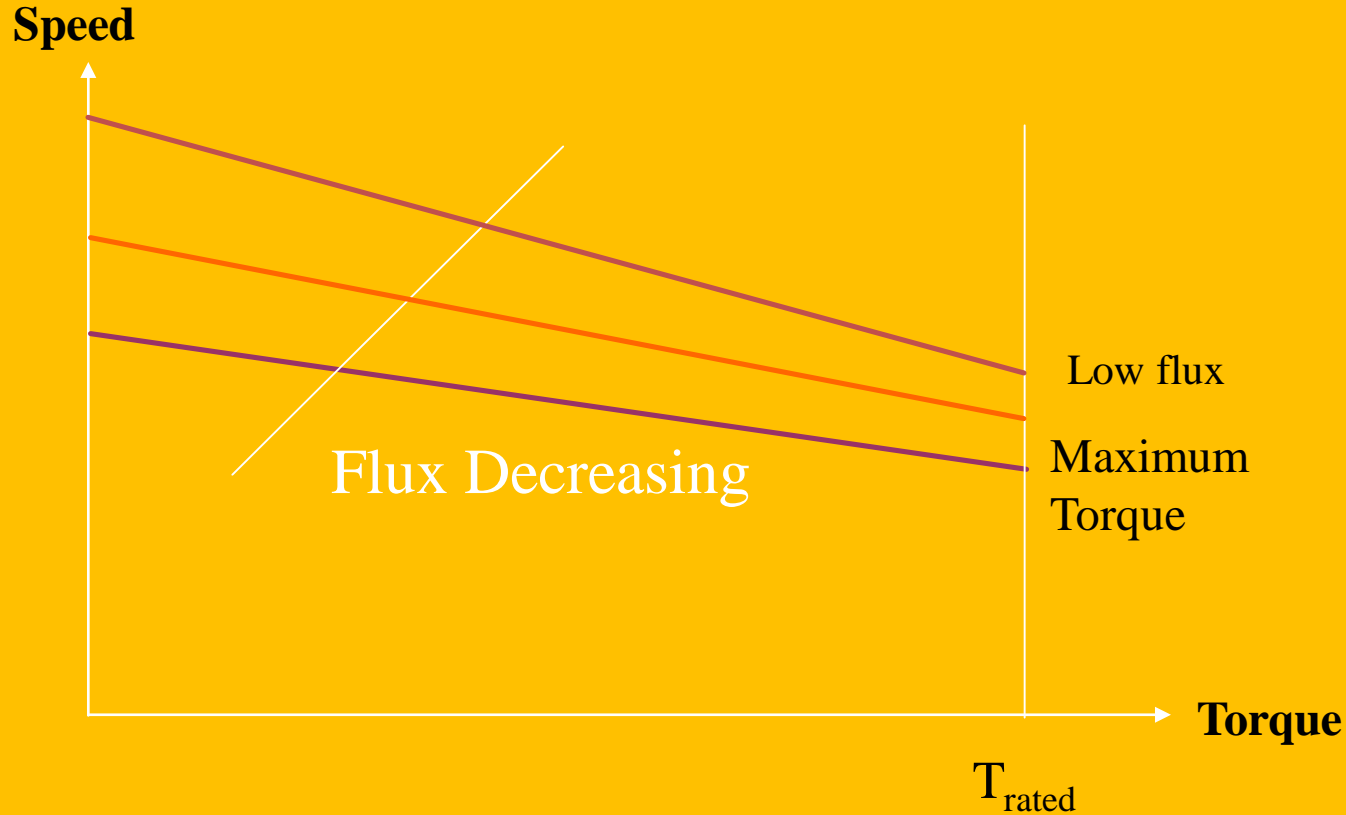3. Armature Voltage Method

1. Speed Control :
Armature Resistance Method

- Power loss in Ra
- Does not maintain maximum torque capability
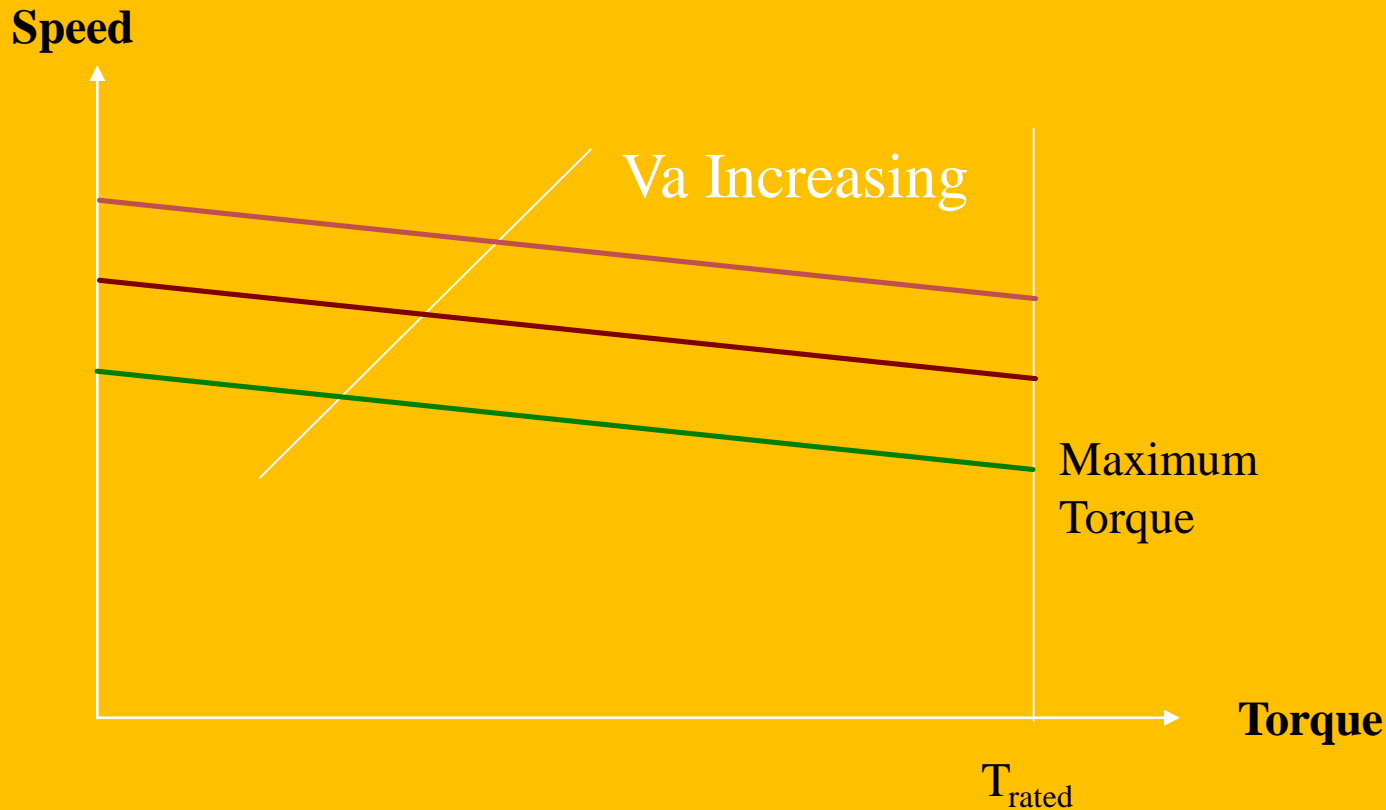- Poor speed regulation

2. Speed Control : Field Flux Method

- Slow transient response
- Does not maintain maximum torque capability

# 3. Speed Control : Supply Voltage Method

- Good speed regulation
- Maintain maximum torque capability

CONSTANT TORQUE – CONSTANT POWER OPERATION

1. **Below base speed:** Armature voltage control (retain maximum torque capability)

2. **Above base speed:** Field weakening (i.e. flux reduced) (Trading-off torque capability for speed)

Armature voltage control

Field flux control

Line of Maximum Torque Limitation

Torque

Speed

ω_{base}
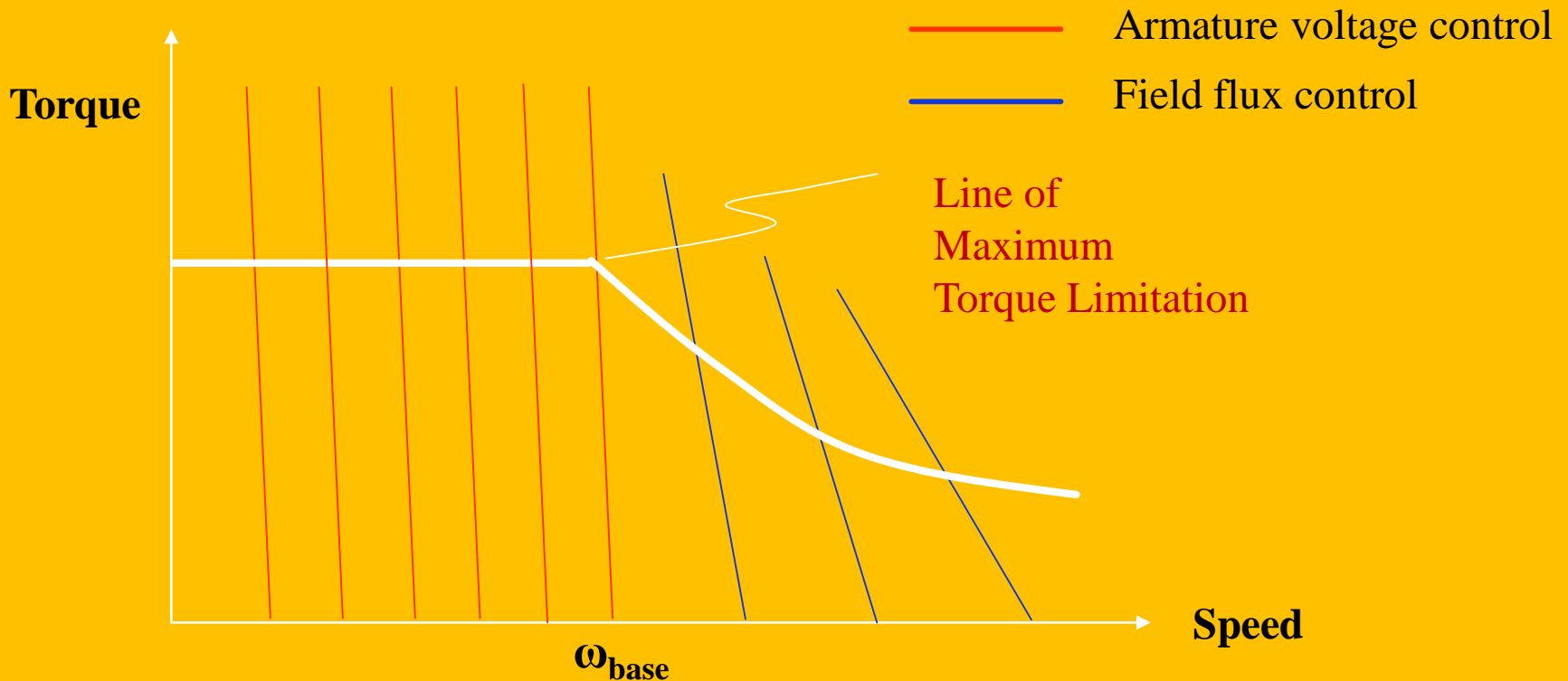
Evaluation Time

Summarize the content…

MCQs

Thanking You.