RAMA UNIVERSITY

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FACULTY OF ENGINEERING & TECHNOLOGY

Electrical Machine-ii

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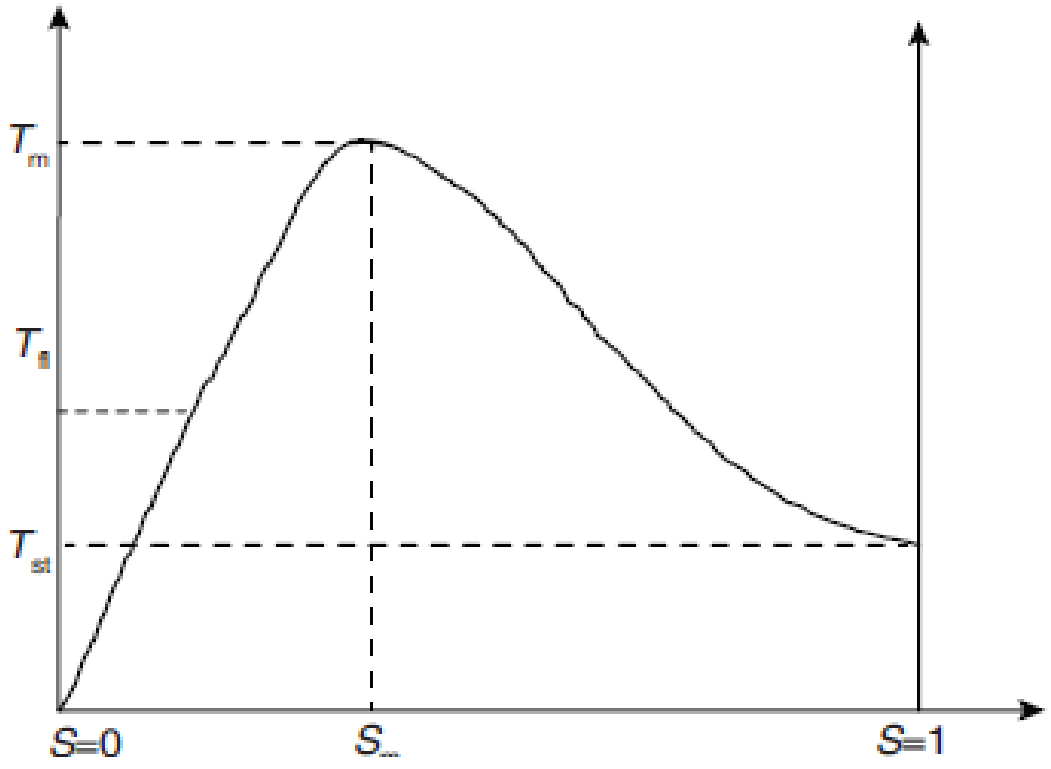
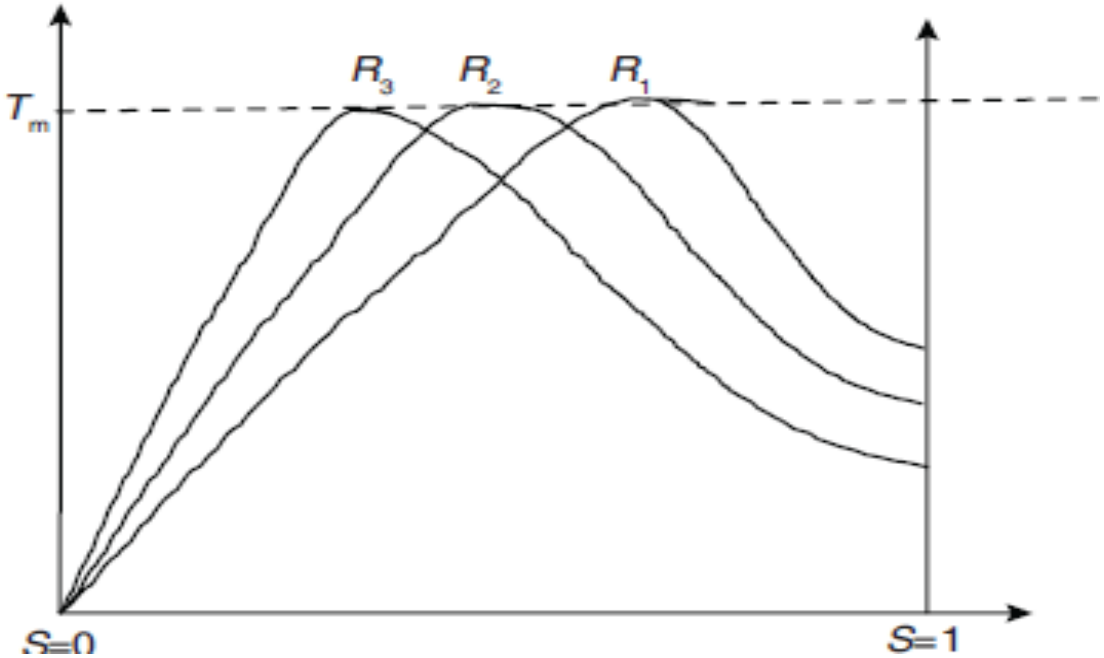
TORQUE SLIP CHARACTERISTICS

- When slip s = 0, Nr = Ns. Under this condition, the motor stops. So the torque (T) at this value of s is zero. This shows that the torque slip characteristics starts from the origin.
- For smaller values of slip, the torque is directly proportional to the slip.
- For larger values of slip, the torque is inversely proportional to slip.



EFFECT OF ROTOR RESISTANCE ON TORQUE–SLIP CHARACTERISTIC



RATIO BETWEEN STARTING TORQUE AND MAXIMUM TORQUE

$$\frac{T_{st}}{T_{max}} = \frac{2s_m}{s_m^2 + 1}$$

Where Tst is the starting torque Tmax is the maximum torque, sm is the slip at maximum torque.

SPEED CONTROL OF THREE PHASE INDUCTION MOTOR

Requirement of Speed Control

- Speed control means change the drive speed as desired by the process to maintain different process parameter at different load .
- Energy Saving.
- Speed control is a different concept from speed regulation where there is natural change in speed due change in load on the shaft.
- Speed control is either done manually by the operator or by means of some automatic control device.
- Low speed starting requirement.

Methods of Speed Control of Induction motors

- Stator voltage Control
- Stator Frequency Control
- Stator Current Control
- V/F Control
- Static rotor resistancecontrol