



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.



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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUB204 – AUTOMOTIVE ELECTRICAL AND ELECTRONICS ENGINEERING

II YEAR / IV SEMESTER

Unit 2 – Starting and Ignition System

Topic : Series Motors and its Characteristics

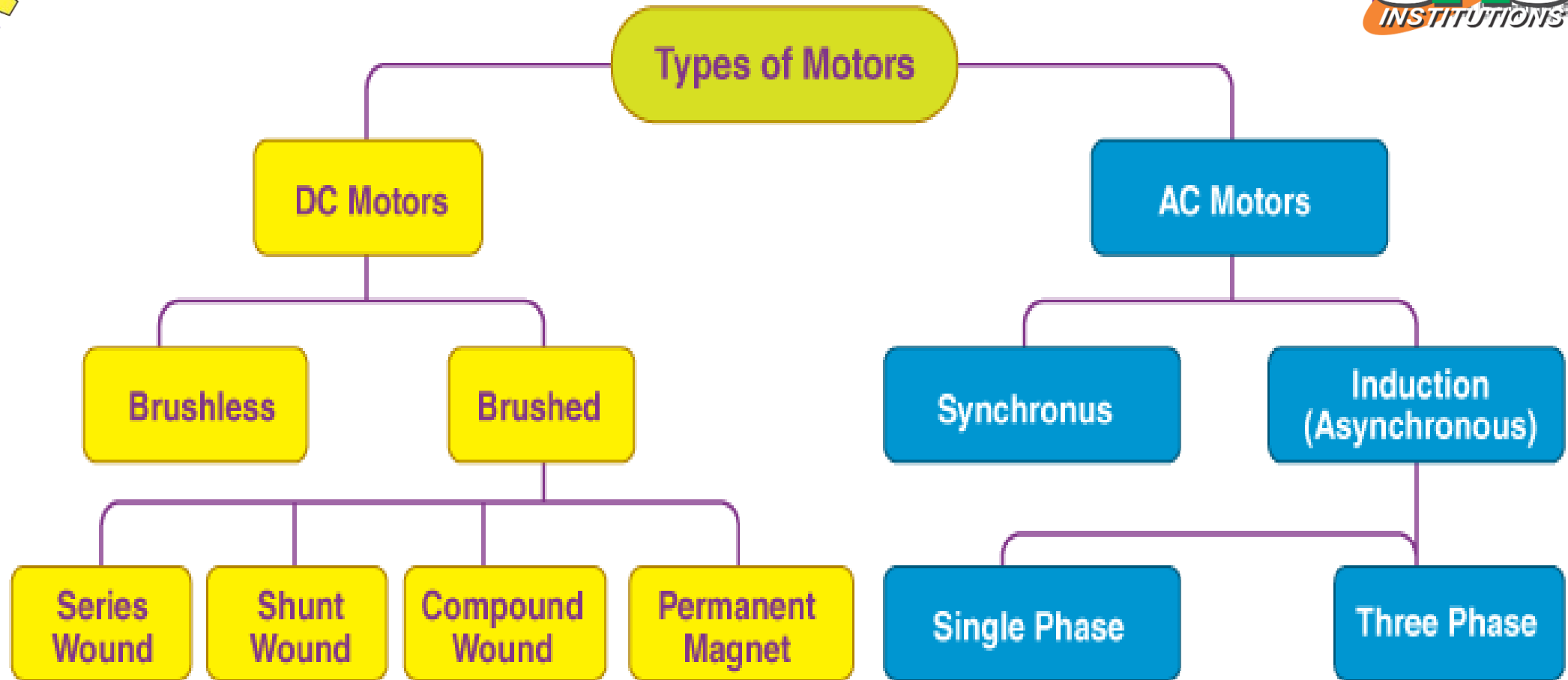


MOTOR



- ❖ Motors are devices that convert electrical energy into mechanical energy.
- ❖ There are various types of motors, each designed for specific applications and operating principles.







SERIES MOTOR



- ❖ A series motor is a type of electric motor where the field winding is connected in series with the armature winding.
- ❖ This configuration allows the same current to flow through both the field winding and the armature winding.





CHARACTERISTICS



- ❖ **High Starting Torque:** Series motors produce very high starting torque compared to other types of motors. This is because the magnetic field produced by the field winding adds to the magnetic field produced by the armature winding during starting, resulting in a strong torque output.
- ❖ **Variable Speed:** Series motors have a variable speed characteristic. As the load increases, the speed of the motor decreases. This is due to the increase in current flowing through both the field and armature windings, which results in a stronger magnetic field and greater torque production.



CHARACTERISTICS



- ❖ **High Power Density:** Series motors have a high power density, meaning they can produce a large amount of power relative to their size and weight. This makes them suitable for applications where space and weight are limited, such as in traction motors for electric vehicles and locomotives.
- ❖ **Simple Construction:** Series motors have a relatively simple construction compared to other types of motors, making them cost-effective and easy to manufacture. They typically have fewer components, which reduces complexity and maintenance requirements.



CHARACTERISTICS



- ❖ **No Load Speed:** Series motors have a very high no-load speed, meaning they can operate at extremely high speeds when there is no load applied to them. However, this can be a disadvantage in some applications where precise speed control is required.
- ❖ **High Efficiency at Full Load:** Series motors are most efficient when operating at full load. However, their efficiency decreases at lighter loads due to the increase in speed and decrease in torque, leading to higher losses in the motor.



CHARACTERISTICS



- ❖ **Limited Speed Regulation:** Series motors have limited speed regulation, meaning they cannot maintain a constant speed under varying load conditions. This can make them unsuitable for applications where precise speed control is required.
- ❖ **Applications:** Series motors are commonly used in applications requiring high starting torque and variable speed, such as electric traction systems in trains, trolleys, and industrial equipment where the load varies widely.



STARTER MOTOR





THANK YOU !!!