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QUESTION 3: Stator Current vs. Speed Characteristics for EE and SE Motor:  
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3.a) Stator current at start-up

Stator current for EE Motor at start-up: 27.8299 < -65.21° A

Stator current for SE Motor at start-up: 23.7497 < -64.62° A

At start-up the stator current of the EE motor is 4.08 A greater than the SE motor. The result is as expected and the slight difference aligns with the general characteristics of EE vs SE motors. The values of R_1 , X_1 and R_2 , X_2 are lower for EE motors, and these lower resistances cause the higher start-up current.

b) Under no-load: The motor experiences high inrush current at start-up, but as the speed increases, the required torque is minimal, so the current drops to a small magnetising current.
Under full-load: The motor experiences high inrush current at start-up, however, as the speed increases, the load torque requires higher current to sustain it.

3.c) Stator current at maximum torque

Stator current for EE Motor at maximum torque: 19.6865 < -43.94° A

Stator current for SE Motor at maximum torque: 16.5792 < -43.97° A

At maximum torque, the stator current is higher as the motor draws more current to maintain the required torque. The value depends on the supply voltage and the stator impedance.

3.d) Stator current under no-load conditions

Stator current for EE Motor under no-load: 2.8902 < -88.87° A

Stator current for SE Motor under no-load: 3.0959 < -88.31° A

Under no-load conditions, the stator current is relatively low as only the magnetizing current is required to maintain the magnetic field.