



# SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

**AN AUTONOMOUS INSTITUTION**



Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai  
**B.E / B.Tech DEGREE MODEL EXAMINATIONS, APR / MAY 2023**

**IV Semester**

**B.E - Mechanical Engineering**

**19EE407 – Electrical Machines and Drives**

**Regulations 2019**

## **PART A**

- | <b>Q.No</b> | <b>Question</b>  |
|-------------|--|
| 1.          | Define Electric Drive.   |
| 2.          | Draw the functional block diagram of an electric drive system.   |
| 3.          | Synchronous motor is not self-starting. Justify.   |
| 4.          | The stepper motor has a step angle of $1.8^\circ$ and is driven at 4000rps. Determine (a) Resolution (ii) Rotor speed. |
| 5.          | Name the protective devices used in DC Motor Starter.  |
| 6.          | Define plugging.   |
| 7.          | Mention the drawbacks of rectifier fed DC drives.  |
| 8.          | Evaluate the necessity of DC choke coil and freewheeling diode in a converter circuit.                                 |
| 9.          | List any two applications of AC drives.  |
| 10.         | Define slip power recovery scheme.   |

## **PART B & C**

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|----|---|
| 11 | Assume with a proper data how the final temperature of electrical motor is reached only after infinite time. Also find the time taken to cool the motor when it's disconnected from the power supply.   |
| 12 | Interpret the choice of selection of electric drive for paper rolling machine in industry.  |
| 13 | (i) A Steeper motor has a step angle of $2.5^\circ$ , determine a) Resolution b) Number of steps per shaft to make 25 revolution c) Shaft speed if starting stepping frequency is 3600 pulse/sec.<br>(ii) Discuss in detail about the construction and working of Reluctance motor with neat diagram. |
| 14 | Discuss the construction and operation of AC servo motor. Also write its application.   |
| 15 | With neat diagram explain the working of any two types of starters used for three phase squirrel cage induction motor.  |
| 16 | With neat sketch explain three point starter to start the DC Shunt Motor. Also list its limitation.   |
| 17 | With a neat sketch explain the operation of four quadrant operation of chopper fed DC drive used for steel rolling mills, railway locomotives.  |
| 18 | Illustrate the operation of single phase half controlled converter fed separately excited DC motor with neat waveforms.   |

- 19** Sketch a neat block diagram of field oriented control of a three phase induction motor used in robotic system and conveyer belt. Also list the functions of a microprocessor in the vector control.
- 20** Categorize the four modes of operation of Static Scherbius Drive with relevant industrial application.
- 21** The temperature rise of a motor when operating for 30min on full load is 20°C and becomes 30°C when the motor operates for another 30min on the same load. Determine heating time constant and steady state temperature rise. Analyze the results with Temperature characteristics.
- 22** Interpret how the microprocessor is employed for a speed control of DC drive in crane and hoist application.