



# SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

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

Accredited by NAAC-UGC with 'A++' Grade (Cycle III) &

Accredited by NBA (B.E - CSE, EEE, ECE, Mech & B.Tech.IT)



## DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

### 23EEB210 – ELECTRICAL MACHINES & DRIVES

#### QUESTION BANK

#### UNIT IV: SOLID STATE SPEED CONTROL OF DC DRIVES

##### Part A – 2 Marks

1. What are power electronic drives?
2. Name some power electronic devices used in motor control.
3. What is the function of a rectifier in a DC drive?
4. What is a chopper in DC motor speed control?
5. Define a controlled rectifier.
6. Explain single-phase controlled rectifiers.
7. What is a fully controlled rectifier?
8. Explain how half-controlled rectifiers work in DC drives.
9. Define dual converter.
10. What are the advantages of using a dual converter in DC drives?
11. What is the purpose of a chopper in DC motor control?
12. Differentiate between step-up and step-down choppers.
13. What is the working principle of a four-quadrant chopper?
14. Explain the significance of a pulse width modulation (PWM) technique.
15. What are the different types of control used in DC choppers?
16. Define digital control of DC motor drives.
17. What is a microcontroller-based DC drive?
18. Explain regenerative braking in controlled DC drives.
19. How do rectifiers help in DC drive applications?
20. What is meant by armature voltage control in DC drives?
21. Explain the principle of current limit control in DC drives.
22. Define phase angle control in rectifiers.
23. What are the applications of DC chopper-based drives?
24. Explain the difference between AC and DC drives.
25. What are the advantages of solid-state DC drives?

##### Part B – Detail

1. Explain the different types of power electronic devices used in motor control.
2. Describe the operation of single-phase controlled rectifiers in DC drives.
3. Explain the working of fully controlled and half-controlled rectifiers in DC drives.
4. Discuss the role of choppers in DC motor speed control.
5. Explain the operation of a four-quadrant chopper.
6. Discuss different types of chopper control techniques.

7. Explain the working of dual converters and their advantages in DC drives.
8. Compare single-phase and three-phase rectifiers for DC motor control.
9. Explain the working of digital control in DC motor drives.
10. Describe microcontroller-based DC motor speed control.
11. Explain the regenerative braking technique in controlled DC drives.
12. Discuss the phase angle control method in rectifiers.
13. Explain the concept of armature voltage control in DC drives.
14. Discuss the current limit control method in DC drives.
15. Explain the effect of supply voltage variation on DC motor speed.
16. Compare PWM control and phase control in DC drives.
17. Explain the design considerations of power electronic DC drives.
18. Discuss the application of DC chopper-based drives in industries.
19. Explain the function of feedback control in DC motor speed regulation.
20. Describe the operation of an IGBT-based DC motor drive.
21. Explain the advantages of using thyristor-controlled DC drives.
22. Discuss the importance of protection circuits in solid-state DC drives.
23. Compare AC and DC motor drive systems.
24. Explain the application of rectifier-fed DC drives.
25. Discuss the future trends in DC motor drive technology.