

R13

Code No: 126AJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, July - 2023

STATIC DRIVES
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

- Note:** i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

- 1.a) State advantages of thyristor controlled drives. [2]
- b) Distinguish between continuous and discontinuous modes of operation of dc drives. [3]
- c) Explain the necessity of electric braking. [2]
- d) Distinguish between circulating and individual controlled dual convertors. [3]
- e) Distinguish between type A and type B chopper drives. [2]
- f) Explain operation of class D chopper drive. [3]
- g) Distinguish between CSI and cycloconvertors fed induction motor drives. [2]
- h) Distinguish between slip power recovery and slip power control methods. [3]
- i) What is PWM? [2]
- j) What is separate control of synchronous motor drive? [3]

PART - B

(50 Marks)

- 2.a) Explain the operation of separately excited dc motor fed by single phase semi convertor.
- b) Explain the difference in operation when above drive is fed by fully controlled convertor. [5+5]

OR

- 3.a) Explain the operation of dc series motor fed by three phase fully controlled convertor.
- b) Explain the operation of above motor when fed by three phase semi convertor. [5+5]

OR

- 4.a) With a neat diagram, explain closed loop operation of D.C. Drive.
- b) Explain how four quadrant operations is possible in D.C. Drives by phase controlled convertors. [5+5]

5. Explain different methods of electric braking applied to d.c. motors. [10]

6. Discuss the operation of 2 quadrant chopper fed D.C. Drive. [10]

OR

7. Discuss the operation of 4 quadrant chopper driven D.C. Drive. Give its merits and demerits. [10]

QA QA QA QA QA QA QA G

- 8.a) Distinguish between VSI and CSI operations with respect to 3-phase I.M.
b) What do you understand from the term slip power recovery? Describe in detail about Static Scherbius drive and its advantages. Draw the necessary diagrams with neat sketch. [5+5]

OR

- 9.a) Explain the mode of control of three phase induction motor by A.C Voltage controller in star and delta operation.
b) Explain the functioning of Static SCHERBIUS Drive in detail with necessary diagram and draw its performance characteristics. [5+5]

QA QA QA QA QA QA QA G

- 10.a) Explain the operation of self-controlled CSI fed synchronous motor drive.
b) Explain the closed loop control of synchronous motor drive with block diagram. [5+5]

OR

- 11.a) "Synchronous motor drive in self-control mode is treated as brush-less, commutator less d.c motor", Justify your answer.
b) Describe in brief about the operation of a cyclo-converter driven synchronous motor with neat diagrams and characteristics. [5+5]

QA QA QA QA QA QA QA G

---ooOoo---

QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G