R13

Code No: 126AJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, February - 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)	What are the different modes of operation of 3-ϕ full converter fed DC drive?	[2]
b)	Why semi converter is called half controlled rectifier? Draw its circuit diagram.	[3]
c)	What is dual converter?	[2]
d)	What is meant by dynamic braking?	[3]
e)	What is four quadrant chopper fed DC drive?	[2]
f)	What are the advantages and disadvantages of chopper fed d.c. drive.	[3]
g)	What is Static Kramer's drive?	[2]
h)	State the advantages and disadvantages of VSI and CSI drives.	[3]
i)	What is self-control of synchronous motor?	[2]
j)	Draw N-T(Speed-Torque) characteristics of synchronous motor with frequency control.	[3]

PART – B

(50 Marks)

2.a) Starting from fundamentals, derive the speed torque relation for DC series motor.
b) Explain the principle of operation of 3- ϕ semi converter connected to DC series motor. [5+5]

OR

3. Explain the neat sketches and the principle of operation of single phase fully controlled rectifier fed DC separately excited motor drive. [10]

4. Explain four quadrant operation of DC separately excited motor fed from three phase dual converter. [10]

OR

5. What is meant by braking? Explain Regenerative braking and Plugging applied to a d.c motor. [10]

6. Explain operation of two quadrant (Class D) chopper fed DC separately excited motor and also draw the current and voltage waveforms for continuous conduction. [10]

OR

7. Explain steady state analysis of Class A chopper fed DC separately excited motor. [10]

8.a) With the help of the block diagram, explain the closed loop operation of Induction motor drive?

b) Explain the speed control of induction motor by variable frequency control. [5+5]

OR

9. Explain the N-T(Speed-Torque) characteristics of induction motor with rotor resistance control. [10]

10. Explain the operation of CSI fed self-control of synchronous motor drive. [10]

OR

11. Explain the closed loop operation of synchronous motor drive with block diagram. [10]

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