

Regulation R17

Subject code: 1P7BA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)



B.Tech IV Year I Semester Supplementary Examinations, July 2022

POWER SEMICONDUCTOR DRIVES

(EEE)

Maximum Marks: 70

Duration: 3 hours

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 A semi converter fed DC motor operates in?
- 2 List the different types of electrical drives.
- 3 What is meant by four quadrant operation
- 4 List the advantages of rotor resistance control
- 5 Define Slip power?
- 6 Step-up chopper is connected to 100V DC source operating with $\alpha=0.6$. Find the average output voltage?
- 7 If type A chopper is connected to a DC source of E_s and is operating with duty cycle of α and supplying continuous current, output voltage is?
- 8 What is meant by stator voltage control?
- 9 Give some application of load commutated inverter fed synchronous motor drive.
- 10 What is meant by margin angle of commutation?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Explain in detail the operation of 3-phase full converter continuous current operation for separately excited DC motor and Sketch Torque and speed characteristics.
OR
- 12 Explain in detail the operation of a 1-phase Semi converter feeding a separately excited d.c motor with reference to voltage and current waveforms, assume motor current is continuous and draw speed-torque characteristics.
- 13 Explain about block diagram of electrical drive. Explain the four quadrant operation of chopper fed separately excited D.C motor
OR
- 14 Describe the three phase four quadrant operation of DC drive using Dual converter
- 15 Describe the performance of VSI based induction motor and list the advantages and disadvantages
OR
- 16 Draw the speed-torque characteristics of the poly phase induction motor. Also explain a) motoring b) Generating and c) Breaking region
- 17 Explain the operation of three phase slip ring induction motor when static krammer drive is employed. Draw the speed torque characteristics and phasor diagram.
OR
- 18 Draw and explain the equivalent circuit of a wound rotor induction motor when voltage is injected in the rotor circuit
- 19 Describe the open loop and closed loop methods of speed control of synchronous motor using VSI.
OR
- 20 With suitable circuit diagrams discuss the principle of operation of self-controlled synchronous motor drive.