R18 Regulation *Subject code:* 2E8BF

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VIII Semester Regular Examinations, June 2022

ELECTRICAL DRIVES

(Electrical and Electronics Engineering)

Maximum Marks: 70 Date:18.06.2022 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Why thyristor is preferred for controlling DC drives?
2 What is continuous current operation in converter?
3 What are the merits of dual converter?
4 What is the function of motoring operations?
5 Why four quadrant operation of chopper is better than single quadrant operation.
6 Draw the speed and torque characteristic of two quadrant DC chopper.
7 Write short notes on PWM control of Induction motor.
8 List out the merits of static rotor resistance control.
9 What is the function of cyclo converter?
10 What are the differences between separate control & self-control of synchronous motor?

Part-B

Answer All the following questions. (5X10M=50Marks)

11 Explain the operation of 1 phase semi-controlled converter fed DC series motor drive with neat diagram and derive the Speed and Torque expressions. [10]

OR

12 Explain the operation of 3 phase fully controlled converter fed DC series motor drive with neat diagram and draw the output voltage and current waveform. [10]

13 Explain the various types of electrical braking in detail with a neat diagram. [10]

OR

14 With a neat diagram explain the four-quadrant operation of DC motors using dual converters.[10]

15 A DC chopper is used to control speed of a separately excited DC motor. The dc voltage is 220V, Ra=0.2Ω and motor constant is 0.6V/rpm. The motor drives a constant load requiring an average armature current of 30A.Determine (i) the range of speed control (ii) the range of duty cycle, assume continuous conduction. [10]

OR

16 A DC series motor is fed from a 600V DC source through chopper. The armature and field resistance of motor are 0.04 and 0.06 ohms respectively. If the motor constant is 4x10-3 Nm/Amp2 and chopper duty cycle is 60%, Determine the motor speed and torque for an average armature current of 200 Amp. [10]

17 Explain how to control the Induction Motor using AC Voltage Controllers with a neat diagram and draw the speed torque characteristics. [10]

OR

18 With a neat diagram explain Static Scherbius Drive in detail. [10]

19 Explain the operation of self-controlled synchronous motors by VSI cyclo converters with a neat diagram. [10]

OR

20 Explain the operation of Load commutated CSI fed Synchronous Motor with a neat diagram and draw the speed torque characteristics. [10]