



R22 Regulation

Subject code:4E5BA

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

## B.Tech V Semester Supplementary Examinations, May 2025

### POWER ELECTRONICS

(EEE)

Maximum Marks: 60

Date: 17.06.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit.
  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 (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	List any one turn on method of thyristor.	1M	1	1
b)	What is meant by commutation?	1M	1	1
c)	Draw the diagram of single-phase half-controlled converter with R load.	1M	2	1
d)	Write the expression for average output voltage for single-phase fully controlled converter with R load?	1M	2	1
e)	Write the applications of DC Chopper?	1M	3	1
f)	What is an AC Voltage controller?	1M	3	1
g)	List the applications of inverters.	1M	4	1
h)	Classify different types of inverters.	1M	4	1
i)	Give advantages of CSI.	1M	5	1
j)	Define bipolar sinusoidal pulse width modulation.	1M	5	1

#### Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	With the help of schematic diagram explain the various modes of operation of thyristor.	10M	1	3
OR				
3	With a neat sketch explain Static and Dynamic characteristics of MOSFET.	10M	1	3
4	Explain about single phase fully-controlled converter with R load and derive the necessary equations for average output voltage and current.	10M	2	3
OR				
5	Explain the operation of three phase half wave converter for R load with waveforms.	10M	2	3
6	With a neat sketch explain the operation of Buck Chopper with its waveforms.	10M	3	3
OR				
7	Explain the operation on single phase AC voltage controller with R load with necessary wave forms.	10M	3	3

8	What is sinusoidal pulse width modulation? Compare unipolar and bipolar for single phase inverters.	10M	4	3
	OR			
9	With a neat sketch explain operation of single phase full wave VSI and derive necessary equations.	10M	4	3
10	Explain the 180° conduction mode of operation of three phase inverters with necessary circuit diagram and waveforms.	10M	5	3
	OR			
11	Compare CSI and VSI.	10M	5	3