



R20 Regulation **Subject code:3E6BC**
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
 (Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Supplementary Examinations, December 2024

**LINE-COMMUTATED AND ACTIVE RECTIFIERS
(EEE)**

Maximum Marks: 70

Date:07.01.2025

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)		CO	Bloom Tx
1	What is meant by filter?	1	L1
2	why series inductor and L-section filters cannot be used with half-wave rectifiers?	1	L1
3	Discuss the design considerations for the inductor of an LC-rectifier filter.	2	L1
4	How are rectifiers classified?	2	L1
5	What is overlap period?	3	L1
6	What is the difference between 6 pulse and 12-pulse rectifier?	3	L1
7	What are the benefits of isolation?	4	L1
8	Discuss AC-DC boost converters?	4	L1
9	What is bidirectional rectifier?	5	L1
10	What is bidirectional power supply?	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	Explain the operation half wave diode rectifier with the help of load voltage and load current waveforms for RL Load. [10M]	1	L2
OR			
12	For an RL half wave rectifier $R=100$, $L=0.1H$, $\omega=377\text{rad/sec}$ and $V_m=100V$. Determine [10M] i. An expression of the current in the circuit. ii. Average current. iii. RMS current iv. Power absorbed by the RL load and v. The power factor	1	L2
13	Explain the operation of single phase fully controlled bridge converter in the discontinuous conduction mode. [10M]	2	L2
OR			
14	Explain the schemes for controlling the dc output of a 3 ϕ bridge rectifier using thyristors with dc side LC filter. [10M]	2	L2

15	Explain the operation of six-pulse diode rectifier with a resistive load and waveforms. [10M]	3	L2
	OR		
16	Explain the operation of idealized six-pulse SCR rectifier with a neat waveforms operating at $\alpha = 30^\circ$. [10M]	3	L2
17	Explain the operation of boost converter in the continuous conduction mode with steady state waveforms? [10M]	4	L2
	OR		
18	Explain the operation of ac-dc fly back converter with neat circuit diagram and voltage, current waveforms? [10M]	4	L2
19	Explain the power circuits of 3-phase ac-dc boost converter with neat circuit diagram? [10M]	5	L2
	OR		
20	Explain the operation of single phase inverter with suitable waveforms? [10M]	5	L2