



R20 Regulation

Subject code: 3E6BC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Supplementary Examinations, July 2024

LINE-COMMUTATED AND ACTIVE RECTIFIERS
(EEE)

Maximum Marks: 70

Date:30.07.2024 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)

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| 1 | Why R-C filters are suitable only for light loads? |
| 2 | Why is bleeder resistance employed in a filter circuit? |
| 3 | Discuss the design considerations for the inductor of an LC-rectifier filter. |
| 4 | How are rectifiers classified? |
| 5 | What is overlap period? |
| 6 | In a 3 phase, 12-pulse controlled converter for continuous conduction mode, each SCR conducts for what radians per cycle. |
| 7 | What's the Difference Between Isolated and Non-Isolated Power Supplies? |
| 8 | Where are boost converters used? |
| 9 | What is bidirectional ac to dc converter? |
| 10 | How do you convert AC to DC? |

Part-B

Answer All the following questions. (10MX 5=50Marks)

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|----|---|
| 11 | Explain the operation half wave diode rectifier with the help of load voltage and load current waveforms for RL Load. [10] |
| OR | |
| 12 | For an RL half wave rectifier $R=100$, $L=0.1H$, $\omega=377\text{rad/sec}$ and $V_m=100V$. Determine: [10]
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 |
| 13 | Explain the operation of single phase fully controlled bridge converter in the continuous conduction mode. [10] |
| OR | |
| 14 | Explain the operation of 3 phase fully controlled bridge converter with circuit diagram, conduction table, phasor diagram of line voltages and waveforms. [10] |

15	Explain the concept of Y/Z -1 phase-shifting transformer with the help of connection diagram and phasor diagram. [10]
	OR
16	With rectifier configuration and current waveform explain the operation of 12-pulse separate type diode rectifier. [10]
17	Explain the operation of boost converter in the continuous conduction mode with steady state waveforms. [10]
	OR
18	Explain the operation of ac-dc fly back converter with neat circuit diagram and voltage, current waveforms. [10]
19	Explain the operation of three phase inverter with suitable waveforms. [10]
	OR
20	Explain the rectification and regenerating modes of operation of ac-dc bidirectional boost converter. [10]