



**B.Tech VI Semester Supplementary Examinations, June 2022**

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

**Maximum Marks: 70**

**Date:22.06.2022 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 R-C filters are suitable only for light loads?
- 2 Why is bleeder resistance employed in a filter circuit?
- 3 Explain the terms minimum load current and bleeder load resistance with respect to a rectifier-LC filter.
- 4 For a half-wave controlled rectifier, draw the load voltage and current waveforms for an inductive load and derive the load power equation.
- 5 What are the advantages of six pulse converter?
- 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.

(5X10M=50Marks)

- 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
  - 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[10]

- 13 Explain the operation of single phase fully controlled bridge converter in the continuous conduction mode. [10]

OR

- 14 Explain the schemes for controlling the dc output of a  $3\phi$  bridge rectifier using thyristors with dc side LC filter. [10]

15 Explain the concept of  $\Delta/Z$  phase shifting transformers with the help of connection diagram and phasor diagram? [10]

OR

16 Explain the performance of effect of line inductance with Voltage and current waveforms during commutation ( $\alpha = 45^\circ$ ). [10]

17 An isolated fly back converter has the data output voltage  $V_o = 30V$ , load resistance = 1.5 ohms, duty cycle = 0.5, switching frequency = 1KHz, transformer turns ratio  $(N_2/N_1) = 0.3$ , initial and peak primary magnetizing current = 0.5A and 30A respectively. Assume ideal power switch and diode and no losses in the circuit calculate (i) average load current (ii) average power switch current (iii) maximum voltage across power switch current and (iv) Primary magnetizing inductance. [10]

OR

18 A. Explain the control of DC-DC converters? [5]  
B. Explain the control techniques of AC - DC boost converter? [5]

19 Explain the operation of single-phase inverter with suitable waveforms? [10]

OR

20 Explain the closed loop operation of inverters? [10]