



B.E DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Seventh Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U18EIE0017: Industrial Electronics Drives

COURSE OUTCOMES

- CO1:** Choose the power devices based on the application.
CO2: Evaluate the performance parameters of AC-DC converters with R, RL and RLE Load.
CO3: Describe the functioning of various DC-DC converters and inverters.
CO4: Identify the drives for various control applications.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

- | | | |
|---|-----|-------------------|
| 1. List the application of power electronics. | CO1 | [K ₄] |
| 2. Why MOSFET is called voltage controlled device? | CO1 | [K ₂] |
| 3. What are the advantages of freewheeling diodes in a rectifier? | CO2 | [K ₂] |
| 4. Discuss the importance of commutation. | CO3 | [K ₂] |
| 5. What is meant by natural commutation? | CO3 | [K ₂] |
| 6. Describe the various methods of thyristor turn ON. | CO2 | [K ₂] |
| 7. What is meant by duty cycle? | CO3 | [K ₂] |
| 8. Describe the working of four quadrant chopper. | CO4 | [K ₂] |
| 9. State different methods of voltage control inverter. | CO4 | [K ₂] |
| 10. Describe about PWM control in inverter. | CO4 | [K ₂] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

- | | | | |
|--|----|-----|-------------------|
| 11. With neat sketch explain the turn ON and turn OFF characteristics of SCR. | 16 | CO1 | [K ₃] |
| 12. Explain the operation of a single phase full bridge converter with RL load for continuous load current | 8 | CO2 | [K ₃] |
| 12. Discuss the working of single phase bridge converter with RLE load. | 8 | CO2 | [K ₂] |

13.	Discuss the principle and operation of DC-DC step up and step down chopper with suitable waveform	16	CO3	[K ₂]
14.	a) Classify the various PWM techniques and explain any one of them.	10	CO3	[K ₄]
	b) Explain the harmonics reduction by transformer corner lines and stepped wave inverter	6	CO3	[K ₂]
15.	a) Compare and contrast the performance characteristics of SCR and MOSFET.	8	CO1	[K ₄]
	b) Construct and explain the basic structure of an IGBT.	8	CO2	[K ₂]
16.	With a neat sketch and output voltage waveforms, explain the working of full bridge SMPS.	16	CO4	[K ₃]
