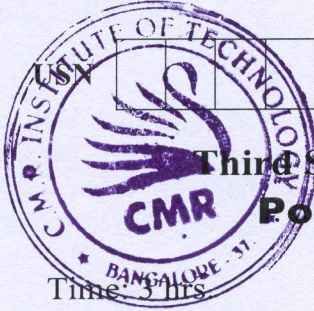


# CBCS SCHEME

18EC36



## Third Semester B.E. Degree Examination, June/July 2024 Power Electronics and Instrumentation

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain the V.I. characteristics of SCR by clearly indicating different states on characteristic. Also explain different modes of operation. (10 Marks)
- b. Explain the UJT Relaxation oscillator circuit working with circuit diagram and waveforms. (10 Marks)

OR

- 2 a. Explain class A – self commutation by resonating the load with proper circuit and waveforms. (10 Marks)
- b. What are the gate triggering schemes? Explain the operation of resistor-capacitor firing circuit with appropriate waveforms. (10 Marks)

### Module-2

- 3 a. Explain the effect of freewheeling diode with a neat circuit diagram and waveform for single phase half wave controlled rectifier with RL load. (10 Marks)
- b. Explain the principle of step up chopper with a neat circuit diagram and waveforms. Also derive the expression for output voltage. (10 Marks)

OR

- 4 a. If the half wave controlled rectifier has a purely resistive load R and the delay angle is  $\alpha = \frac{\pi}{3}$ . Identify: (i) Rectification efficiency (ii) Form factor (iii) Ripple factor (iv) TUF (v) PIV (10 Marks)
- b. Explain the principle of step up / down chopper with a neat circuit diagram and waveforms. Also derive the expressions for output voltage. (10 Marks)

### Module-3

- 5 a. Explain the working of single phase half bridge inverter connected to RL load with the help of necessary circuit diagram and waveforms. (10 Marks)
- b. Explain the working of continuous mode fly back converter with necessary circuit diagram and waveform. (10 Marks)

OR

- 6 a. Define the following terms as applied to an electronic instrument:  
(i) Instrument (ii) Measurement (iii) Accuracy (iv) Resolution  
(v) Precision (vi) Expected value (vii) Error (viii) Sensitivity (10 Marks)
- b. Sketch and explain the operation of a multirange voltmeter. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.



**Module-4**

- 7 a. Discuss the operation of dual slope integrating type DVM with the help of block diagram. (10 Marks)  
b. Explain the operation of the Wein's bridge with a neat circuit diagram. Derive the expression for the frequency. (10 Marks)

OR

- 8 a. Explain the operation of a function generator with the help of block diagram. (10 Marks)  
b. With the aid of diagram, explain the working of balanced wheat stone bridge and derive for a galvanometer current expression. (10 Marks)

**Module-5**

- 9 a. Explain the construction, working principle and operation of LVDT. Show the characteristics curve. (10 Marks)  
b. Explain the construction of temperature indicators using thermistor. (10 Marks)

OR

**CMRIT LIBRARY**  
BANGALORE - 560 087

- 10 a. Explain the construction and working of instrumentation amplifier using transducer bridge. (10 Marks)  
b. Explain the structure and operation of programmable logic controller. (10 Marks)

\*\*\*\*\*