

CBCS SCHEME

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18EC36

Third Semester B.E. Degree Examination, July/August 2021

Power Electronics and Instrumentation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Briefly explain power electronic system with neat block diagram. (04 Marks)
b. Mention and explain the different types of power electronic converters and mention their any two applications. (08 Marks)
c. Explain an operation of resistance firing circuit with neat waveforms. (08 Marks)
- 2 a. Explain with a neat circuit diagram VI characteristics of SCR, define the latching current, break over voltage and holding current. (08 Marks)
b. Explain briefly about the gate triggering circuits with waveforms. (08 Marks)
c. Explain with a neat circuit diagram basic operation of uJT. (04 Marks)
- 3 a. Explain with neat waveforms phase angle control and PWM control. (09 Marks)
b. Explain briefly how choppers are classified. (06 Marks)
c. A DC chopper circuit connected to a 100V DC source supplies an inductive load having 40mH in series with a resistance of 5Ω. A freewheeling diode is placed across the load. The load current varies between the limits of 10A and 12A. Determine the time ratio of the chopper. (05 Marks)
- 4 a. Explain the working principle of stepdown chopper with neat circuit diagram and waveforms. And derive the equations for rms voltage and current. (10 Marks)
b. With necessary waveforms explain the operation of a single phase half wave controller with inductive load. Derive the expression for average load voltage. (10 Marks)
- 5 a. How inverters are classified. (04 Marks)
b. With a neat circuit diagram and waveforms explain the operation of single phase half bridge inverter with resistive load. (08 Marks)
c. A basic D'Arsonval movement with an internal resistance of 50Ω and a full scale deflection current of 2mA is to be used as a multi range voltmeter. Determine the series resistance to obtain the voltage ranges of D-10V, 0-50V, 0-100V. (08 Marks)
- 6 a. Briefly explain the discontinuous mode fly back converter. (10 Marks)
b. What are the different types of static characteristics and define each term. (10 Marks)
- 7 a. Draw the block diagram and explain the working principle of dual slope integrating type DVM. (08 Marks)
b. Explain the working principle of digital frequency meter with basic circuit. (06 Marks)
c. Derive an balance bridge equation for wheat stone's bridge. (06 Marks)
- 8 a. With help of staircase waveform and block diagram explain the working of staircase ramp-type voltmeter. (06 Marks)
b. With block diagram, explain the time base selector. (06 Marks)
c. Derive an equation for unbalanced wheat stone's bridge. (08 Marks)
- 9 a. Write a brief note on potentiometer type resistive transducer. (06 Marks)
b. Explain the working of analog weight scale. (06 Marks)
c. With a neat diagrams, explain the PLC structure. (08 Marks)
- 10 a. With a neat sketch, explain construction and working of LVDT. (10 Marks)
b. Write a note on PLC operation and relays. (10 Marks)

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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.