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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE) (E-I 2012 to 2017) (Sem.-6)

**INDUSTRIAL ELECTRONICS**

Subject Code : BTEC-903

M.Code : 71232

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A****1. Answer briefly :**

- a) What is the need of commutation process?
- b) What is the function of freewheeling diode?
- c) Discuss the need of equalization in parallel connections of SCRs.
- d) Discuss the significance of ON and OFF cycles in integral cycle control.
- e) What is finger voltage?
- f) Define total harmonic distortion.
- g) Discuss time ratio control in choppers.
- h) What is forced commutated inverters?
- i) Why protection against  $dv/dt$  is necessary?
- j) What is the function of crowbar circuit?

**SECTION-B**

2. Draw and explain the static and dynamic characteristics of SCRs.
3. Describe the basic principle of working of single phase to single phase stepdown cycloconverter for both continuous and discontinuous conduction for bridge type cycloconverter.
4. What is the need of series connections of SCRs? Explain series operation of SCR's and equalization circuits with suitable circuits.
5. Explain resistance-triggering & RC- triggering circuit for a thyristor.
6. What is the need of chopper? A dc chopper has an input voltage of 230 V and an output voltage of 150 V. It is operating at a frequency of 1 kHz. Find the periods of conduction and blocking in each cycle.

**SECTION-C**

7. Explain the circuit of the single-phase fully controlled bridge rectifier with RL load and with freewheeling diode. Also draw the waveforms.
8. Describe the working of a single-phase half bridge inverter. What is its main drawback? How can this drawback be overcome?
9.
  - a) Describe the working of single phase half wave converter feeding a separately excited DC motor with suitable circuits and waveforms.
  - b) Describe the principle of phase control in single phase half wave AC voltage controller. Derive the expression for rms value of output voltage.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**