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**B. TECH**  
**(SEM-VI) THEORY EXAMINATION 2017-18**  
**INDUSTRIAL ELECTRONICS**

**Time: 3 Hours****Total Marks: 100****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief. 2 x 10 = 20**

- a. Explain the basic principle of converters.
- b. Compare the GTO and Triac.
- c. What is current limit control?
- d. Draw the V-I characteristic of TRIAC.
- e. List the applications of voltage source inverter.
- f. Explain the basic principle of Thyristor.
- g. List the advantages of current commuted copper.
- h. Discuss about the significance of rotor resistance control.
- i. Write the differences between AC drives and DC drives.
- j. What is the role of damper winding in a synchronous motor?

**SECTION B****2. Attempt any three of the following: 10 x 3 = 30**

- a.
  - (i) What is MCT? How is it differing from SCR?
  - (ii) What is the difference between current controlled transistors and voltage controlled transistors?
- b. What do you mean by the three phase inverter? Explain its working with its output waveforms.
- c. Explain the thyristor turn-on methods. What are the applications of thyristor?
- d. Explain the operation of separately excited dc motor driven using a semi-converter.
- e.
  - (i) Draw a suitable diagram & explain working of slip power recovery system using commutator-less Kramer drive.
  - (ii) Enumerate the variable frequency control of an induction motor.

**SECTION C****3. Attempt any one part of the following: 10 x 1 = 10**

- (a) Explain the current protection schemes for thyristors. Why it is required?
- (b)
  - (i) Write a note on resistance capacitance firing circuit.
  - (ii) The voltage and current rating in a particular circuit are 3KV and 750A respectively. SCRs with a rating of 800V and 175A are available. Minimum derating factor is 15%. Determine the number of series and parallel units required.

4. Attempt any *one* part of the following: 10 x 1 = 10
- (a) What is extinction angle and conduction angle? Explain the effect of freewheeling diode in a bridge rectifier connected to R-L load.
  - (b) Explain the working of three phase bridge inverter with its different characteristics.
5. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Explain the principle of chopper operation. Also Explain the working of step-up chopper.
  - (b) Explain the speed control of DC series motor using single phase full converter.
6. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Explain four quadrant chopper drives. Define 3-phase semi-converter drives.
  - (b) Explain the basic principle of operation of step up and step down chopper with its V-I characteristics.
7. Attempt any *one* part of the following: 10 x 1 = 10
- (a) (i) Explain the construction and working of three phase induction motor.  
(ii) Discuss about any one method for speed control of induction motor.
  - (b) Define speed control of induction motors. Define the method of resistance control.