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

Time: 3 Hours

a.

Total Marks: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief.

- 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

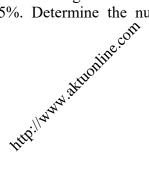
2. Attempt any *three* of the following:

- (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 semiconverter.
- 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:

- (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.



 $2 \ge 10 = 20$

 $10 \ge 3 = 30$

 $10 \ge 1 = 10$

4. Attempt any one part of the following:

- What is extinction angle and conduction angle? Explain the effect of (a) freewheeling diode in a bridge rectifier connected to R-L load.
- Explain the working of three phase bridge inverter with its different (b) characteristics.

5. Attempt any one part of the following:

- Explain the principle of chopper operation. Also Explain the working of step-(a) up chopper.
- Explain the speed control of DC series motor using single phase full converter. (b)

6. Attempt any one part of the following:

- Explain four quadrant chopper drives. Define 3-phase semi-converter drives. (a)
- Explain the basic principle of operation od step up and step down chopper wth (b) its V-I characteristics.

7. Attempt any *one* part of the following:

- (a) (i)Explain the construction and working of three phase induction motor. (ii) Discuss about anyone method for speed control of induction motor.
- (b) Define speed control of induction motors. Define the method of resistance control.



$10 \ge 1 = 10$

 $10 \ge 1 = 10$

 $10 \ge 1 = 10$

$10 \ge 1 = 10$