

6E6053

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B.Tech. VI-Sem (Main & Back) Examination, April-May. 2018
Electronics & Communication Engg.
6EC3A Industrial Electronics

Time : 3 Hours]

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[Maximum Marks : 80**[Min. Passing Marks : 26**

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. _____ Nil 2. _____ Nil

UNIT - I

- 1 (a) Describe the working of an IGBT. How does latch-up occur in an IGBT ? 8
- (b) Differentiate between power transistor and bipolar junction transistor. 4
- (c) Compare the I-V characteristics of Diac and Triac. 4

OR

- ✓ (a) Explain switching characteristics of SCR with suitable diagrams. 8
- (b) What are the constructional features of a GTO that bestows it with a gate turn off capability ? How do they affect the turn on performance of the GTO ? 8

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UNIT - II

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- 2 (a) What is current source inverter ? Explain working of single phase current source inverter with circuit diagram and draw the output waveforms. 10
- (b) A 230 V, 50 Hz, one pulse SCR controlled converter is triggered at a firing angle of 15° and the load current extinguishes at an angle of 180° , find the
- (i) Average output voltage
 - (ii) Average load current

6

OR

- 2 (a) A single phase half wave diode rectifier feeds power to RL load with free wheeling diodes. Describe the working of rectifier with relevant waveforms. 8
- (b) Explain the operation of three phase inverter in 120° mode of operation with suitable waveforms. 8

UNIT - III

- 3 (a) What is SMPS ? Describe SMPS using half bridge and full bridge configuration. 8
- (b) Explain the operation of forward converter. 8

OR

- 3 (a) Explain the working of uninterruptible power supply. 8
- (b) A set-up chopper has output voltage of two to four time the input voltage. For a chopping frequency of 2000 Hz, determine the range of off period for the gate signal. 8

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8

UNIT - IV

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- 4 (a) Explain the speed control of DC motors using choppers. 8
- (b) Describe static rotor-resistance control method for the speed control of a 3-phase induction motor. 8

OR

- 4 Explain the frequency controlled method for speed control of three phase induction motor and derive the expression of maximum torque for voltage and frequency controlled three phase induction motor. 16

UNIT - V

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- 5 Write short notes on :
- (a) Three phase variable reluctance stepper motor.
- (b) Dielectric heating control.

8+8=16

OR

- 5 (a) Explain the working and various characteristics of permanent magnet stepper motor. Compare the advantages and disadvantages with hybrid stepper motor. 12
- (b) Write advantages and disadvantages of induction heating. 4

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