6E3044

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# 6E3044

## B. Tech. VI Sem. (Main & Back) Exam., May/June-2014

## Applied Electronics

## 6AI3 Industrial Electronics

## Common with 6AI EC3, & 6EI3

**Time: 3 Hours** **Maximum Marks: 80**

**Min. Passing Marks: 24**

***Instructions to Candidates:-***

*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 may suitably be assumed and stated clearly.*

*Units of quantities used/ calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

1. Nil 2. Nil

## UNIT-I

Q.1. (a) Draw and explain the characteristics of MOSFET. [8]

(b) Explain the two transistor Model of SCR. [8]

**OR**

Q.1. (a) Draw & explain the characteristics of IGBT. [8]

(b) Differentiate between SCR and GTO. [8]

## UNIT-II

Q.2. (a) A 230V, 50Hz, one Pulse SCR controlled converter is triggered at a firing angle of 40° and the load current extinguishes at an angle of 210°. Find the -

(i) Average output voltage

(ii) Average load current [8]

Q.2. (b) Explain the single phase asymmetrical convertor with suitable waveforms. Determine the average output voltage formula. [8]

**OR**

Q.2. (a) Explain the 180° mode of voltage source inverter. [8]

(b) Describe the voltage control techniques in inverter [8]

## UNIT-III

Q.3. (a) A DC Chopper has a resistive load of 20Ω and input voltage $V_s$ = 220V. When the chopper is on, its voltage drop is 1.5V and chopping frequency is 10 kHz. If duty cycle is 80% determine the average output voltage, rms output voltage and chopper on time. [8]

(b) Explain the step up chopper. [8]

**OR**

Q.3. (a) Explain the block diagram of switch mode power supply. [8]

(b) Explain the online UPS. [8]

## UNIT-IV

Q.4. (a) A separately excited DC Motor operating from a single phase half controlled bridge converter at a speed of 1400 r.p.m. has input of 330 sin 314t and back e.m.f. of 80V. $\alpha=30°$ in every half cycle at armature resistance Ra = 4Ω. Calculate average armature current and motor torque. [8]



(b) Explain the stator voltage control methods for three phase squirrel cage induction motor. [8]

**OR**

Q.4. (a) Explain variable frequency control methods for three phase squirrel cage induction motor. [8]

(b) Explain the speed control of DC motors using choppers. [8]

## UNIT-V

Q.5. (a) Explain the induction heating and its advantages & disadvantages. [8]

(b) Describe the driver circuits for stepper motors. [8]

**OR**

Q.5. (a) Explain the hybrid stepper motor. [8]

(b) Differentiate between Variable Reluctance and Permanent Magnet stepper motor. [8]

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