

**6E3044**

Roll No. \_\_\_\_\_

Total No of Pages: **3****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 &amp; 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  $40^\circ$  and the load current extinguishes at an angle of  $210^\circ$ . 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  $180^\circ$  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  $20\Omega$  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.  $\alpha=30^\circ$  in every half cycle at armature resistance  $R_a = 4\Omega$ . 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]