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BIEE-024

01384

B.Tech. IN ELECTRICAL ENGINEERING

Term-End Examination

June, 2013

BIEE-024 : POWER ELECTRONICS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any five** questions. Each question carries **equal** marks.*

1. (a) Describe reverse recovery characteristics of diodes. Show that reverse recovery time and peak inverse current are dependent upon storage charge and rate of change of current. **10**

   (b) Discuss and draw the static V-I characteristic of power diode. **4**

2. (a) What are different methods of firing employed for SCR triggering ? Explain UJT firing circuit with relevant waveforms. **10**

   (b) Define di/dt and dv/dt ratings of SCR. **4**

3. Discuss the working of single-phase full wave ac-dc converter taking into account the effect of source inductance. Draw the output voltage waveform for firing angle 30 degrees. **14**

4. What is a Pulse Width Modulation (PWM) ? List the various PWM techniques. How do these differ from each other ? 14

5. Explain the need of commutation in thyristor circuits. What are the different methods of commutation schemes ? Discuss one of them, involving two thyristor, with a neat schematic and waveforms. 14

6. (a) Describe the principle of step-up chopper. Derive an expression for the average output voltage in terms of input dc voltage and duty cycle. State the assumption made. 10

   (b) What is the difference between voltage commutation and current commutation ? 4

7. Write short notes on ***any two*** of the following : 7x2=14

   (a) Gate Turn-off Thyristors (GTO)

   (b) Series and parallel operation of thyristors

   (c) TRIAC and DIAC