

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-V • EXAMINATION – SUMMER 2013****Subject Code: 152405****Date: 23-05-2013****Subject Name: Power Electronics Applications****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Draw the block diagram of power electronics system. Explain each block in detail. **07**  
(b) Draw the construction of SCR. Explain static V-I characteristics of SCR. **07**
- Q.2** (a) Define Inverter. Explain the working of 1-phase full wave bridge inverter with neat circuit diagram and waveforms. **07**  
(b) Explain construction, working and characteristics of IGBT. **07**
- OR**
- (b) List the power electronics modulators. Explain working of DC-DC converter with necessary diagrams. **07**
- Q.3** (a) Draw the block diagram of SMPS. Explain each block in detail. **07**  
(b) Describe the application of power electronics for solar energy utilization in power generation. **07**
- OR**
- Q.3** (a) Explain On-Line and Off-Line UPS with block diagram. **07**  
(b) Explain HVDC transmission system with the help of schematic diagram. List its advantages and disadvantages. **07**
- Q.4** (a) Explain the working of electronics ballast with neat block diagram. **07**  
(b) Draw the block diagram of electronic timer. Explain the electronic timer using UJT and Thyristor. **07**
- OR**
- Q.4** (a) Explain electronic fan regulator circuit with neat diagram and waveforms. **07**  
**Q.4** (b) Explain AC static switch and DC static switch using power switch. **07**
- Q.5** (a) Explain the concept of electric motor drive using block diagram. **07**  
(b) Explain the synchronous motor drive in detail. **07**
- OR**
- Q.5** (a) Explain working of 1-phase full wave controlled rectifier with R load. Draw the necessary waveforms. **07**  
(b) Explain the speed control of dc motor. Explain different types of dc drives in brief. **07**

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