

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – WINTER • 2014****Subject Code: 152405****Date: 08-12-2014****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 functionality & working of each in detail. **07**
- (b) Do as directed: 1. Draw the detail block diagram indicating all parts of electric motor drive. 2. Enlist the function of power electronics modulator in drive system. 3. List the advantage & disadvantages of electrical drive. **07**
- Q.2** (a) What is thyristor! Explain its construction, operating principle & v-I charact. Of S.C.R. **07**
- (b) Draw symbols & v-I charact. Of 1. power diode 2. D.I.A.C. 3. POWER B.J.T. 4. U.J.T. 5. TRAC 6. POWER MOSFET 7. I.G.B.T. **07**
- OR**
- (b) Discuss charact. Of ideal switch & explain each in detail. **07**
- Q.3** (a) Define commutation. Describe thyristor turn off mechanism in detail. List the method of commutation. **07**
- (b) What is inverter! Explain classification of inverter in details. List the requirement of practical inverter. **07**
- OR**
- Q.3** (a) Define turn on time. Describe thyristor turn on mechanism in detail. List the method of triggering. **07**
- (b) Explain classification of chopper. Explain working of step down chopper using circuit diagram & neat waveform. **07**
- Q.4** (a) Define s.m.p.s. Explain the classification of it & also, explain working of s.m.p.s with necessary block diagram. **07**
- (b) Define u.p.s. Explain the classification of it & also, explain working of u.p.s. with necessary block diagram. **07**
- OR**
- Q.4** (a) Compare the following terms: 1. induction & dielectric heating. 2. Conventional & load proportional capacity modulated heat pump. **07**
- (b) Compare the following terms: 1. AC & DC motor drive 2. Electroplating & electroforming. **07**
- Q.5** (a) Explain the working, advantages, disadvantages & application of electronic ballast using block diagram. **07**
- (b) Explain the configuration of H.V.D.C. transmission along with its advantages, disadvantages & application. **07**
- OR**
- Q.5** (a) Define electrical welding. Explain the working, advantages, disadvantages & application of switched mode arc welder using block diagram. **07**
- (b) Explain the utilization of non conventional energy sources in power generation using power electronics with necessary diagram. **07**
