

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – WINTER 2013****Subject Code: 152405****Date: 09-12-2013****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 and Explain functionality and working of each block in detail. **07**

(b) Do as directed

1. Draw the detailed block diagram indicating all parts of Electrical Motor Drive. **02**

2. Enlist the function of Power Electronics Modulator in Drive system. **03**

3. List the advantages and disadvantages of Electrical drive. **02**

Q.2 (a) Draw symbols and V-I characteristics of (a) Diode (b) DIAC (c) Power BJT (d) UJT (e) TRIAC (f) Power MOSFET (g) IGBT **07**

(b) What is thyristor? Explain its construction, operating principle and V-I Characteristics of SCR. **07**

OR

(b) Discuss Characteristics of ideal switch and 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 and neat waveform. **07**

Q.4 (a) Define SMPS. Explain the classification of it and also explain working of SMPS with necessary block diagram. **07**

(b) Compare the following terms:

1. Induction and Dielectric heating **04**

2. Conventional and load proportional capacity modulated heat pump **03**

OR

Q.4 (a) Define UPS. Explain the classification of it and also explain working of UPS with necessary block diagram. **07**

(b) Compare the following terms: **04**

1. AC and DC Motor Drive 2. Electroplating and Electroforming. **03**

Q.5 (a) Explain the working, advantages, disadvantages and application of Electronic Ballast using block diagram. **07**

(b) Explain configuration of HVDC Transmission along with its advantages, disadvantages and application. **07**

OR

Q.5 (a) Define Electrical Welding. Explain the working, advantages, disadvantages and 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**
