

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – II • EXAMINATION – WINTER 2012

Subject code: 1724502**Date: 31-12-2012****Subject Name: Power Electronics - II****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) Explain L type ZCS resonant inverter with neat circuit diagram and waveform. **07**
- (b) Draw & explain the power schematic of a seven level inverter formed by cascading two conventional H bridge inverters having unequal DC bus voltage. **07**

- Q.2** (a) What is the necessity of multi level inverter? What are the advantages of multi level inverter over two level inverter? **07**
- (b) Briefly explain the operation of resonant DC link inverter with circuit diagram and waveform. **07**

OR

- (b) Design a class E resonance inverter for optimum values with following specifications: **07**
- 1) DC voltage $E_{dc} = 24 \text{ V}$
 - 2) Load resistance $R = 12 \Omega$
 - 3) Switching frequency $f_s = 20 \text{ kHz}$
 - 4) Quality Factor $Q = 7$

- Q.3** (a) What are the types of active power filters? Explain any one in detail. **07**
- (b) Explain single phase boost power factor correction circuit with diagram. **07**

OR

- Q.3** (a) 1) Give the comparison between ZCS and ZVS converter **04**
- 2) Explain overlapping and non overlapping mode of operation in the case of full bridge series resonant inverter with bidirectional switches. **03**
- (b) What are the applications of unity power factor rectifier? Explain any one in details. **07**

- Q.4** (a) Explain 3 Φ input to 3 Φ output matrix converter. **07**
- (b) Draw and explain 12 pulse converter with circuit diagram. **07**

OR

- Q.4** (a) Compare all the three topologies of multi level inverter. **07**
- (b) Explain 5 level NPC multi level inverter and indicate voltage blocking capacity on each of the device. **07**

- Q.5** (a) Explain the steps to design the inductor used in dc-dc converter. **07**
- (b) Discuss the steps to design EMI filter. **07**

OR

- Q.5** (a) 1) What are the applications of multi pulse converter? **03**
- 2) Explain 5th and 7th harmonics elimination in 12 pulse converter? **04**
- (b) What are the selection factors for magnetic components? **07**
