

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1724502****Date: 09/07/2012****Subject Name: Power Electronics-II****Time: 10:30 am – 13:00 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) List the application of multilevel inverter and explain one in detail. **07**
(b) Explain half bridge series resonant inverter with unidirectional switches. **07**
- Q.2** (a) Derive formula of power factor for non linear load and explain in terms. **07**
(b) Explain the frequency response of parallel loaded resonant inverter. **07**
- OR**
- (b) Explain the full bridge series resonant inverter with bidirectional switches in non overlapping mode. **07**
- Q.3** (a) Explain H-bridge 5-level Inverter. **07**
(b) Explain zero voltage switching (ZVS) resonant converter. **07**
- OR**
- Q.3** (a) Derive the formula for instantaneous current in series resonant inverter. Also derive the time required to reach peak value of current. **07**
(b) The full bridge series resonant inverter with unidirectional switches has $L = 45 \mu\text{H}$, $C = 7 \mu\text{F}$, and $R = 4 \Omega$. The frequency of output voltage is 4.5 kHz and DC input is 200 Volt. SCR turn off time is 15 μSec . Calculate: **07**
(a) Circuit turn off time,
(b) Maximum possible output frequency and
(c) Capacitor voltage.
- Q.4** (a) Explain buck boost topology for PFC converter. **07**
(b) Explain with diagram different types of active power filter. **07**
- OR**
- Q.4** (a) Draw and explain how single phase PFC topology can be used to implement three phase PFC solution. **07**
(b) Classify the AC-DC multipulse converter based on phase shift. Draw and explain 12 pulse series type diode rectifier. **07**
- Q.5** (a) Explain the steps to design the inductor used in dc-dc converter. **07**
(b) Discuss the selection factor for the magnetic component. **07**
- OR**
- Q.5** (a) Discuss the steps to design EMI filter. **07**
(b) What is a matrix converter? Explain with three phase circuit supplying three phase load. **07**
