

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER – VI EXAMINATION – WINTER 2015

Subject Code:162405**Date:10 /12/ 2015****Subject Name: Power Processing Circuits - I****Time:2:30pm to 5:00pm****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) Define series resonance. Discuss Zero Current Detection Circuit with necessary diagram & equations. **07**
- (b) Discuss 1-Phase half wave uncontrolled rectifier with motor load. Draw waveforms for V_s , V_o , I_o , I_s & V_D . **07**
- Q.2** (a) Discuss DC–DC converter operation used to operating motor in forward rotating & forward breaking mode. **07**
- (b) Explain working of Cuk' converter with necessary diagrams. **07**
- OR**
- (b) Enlist various isolated converters. Explain inverting converter with necessary diagrams & waveforms. **07**
- Q.3** (a) Enlist the requirement of isolation. Discuss Fly-back type converter. Derive equation for filter inductor & capacitor. **07**
- (b) Write short note on Multi Quadrant Chopper. **07**
- OR**
- Q.3** (a) With the use of circuit diagram & waveform explain Push-pull converter. Also list out various applications of converter. **07**
- (b) Explain Jone's chopper with necessary diagrams. Write modeling equations for the same. **07**
- Q.4** (a) Discuss operation of 3–Phase controlled rectifier with R load. Draw waveforms for output voltage & output current at $\alpha = 60^\circ$. **07**
- (b) 'Linear Regulated Power Supply is not suitable for high power rating applications.' Justify the statement. **07**
- OR**
- Q.4** (a) Explain operation of 1-phase half controlled converter with RL load. Derive equation for average & RMS output voltage. **07**
- (b) What is the requirement of input filter for linear regulated power supply? Enlist different types of filter circuits & explain any one in brief. **07**
- Q.5** (a) Explain 1-Phase full wave controlled rectifier circuit with RL load in continuous conduction mode with $\alpha = 120^\circ$. **07**
- (b) Explain effects of 1- phase uncontrolled rectifier on Neutral Currents on 3-Phase, 4 wire systems. **07**
- OR**
- Q.5** (a) Define following terms with necessary diagrams **07**
 (1) Firing Angle (2) Overlap angle
- (b) Discuss operation of 1-Phase semi-converter circuit with RLE load in discontinuous conduction mode. **07**
