

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII EXAMINATION – WINTER 2015

Subject Code: 170906

Date:04/12/2015

Subject Name: Advanced Power Electronics-I

Time: 10:30am to 1:00pm

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) Draw circuit diagram and output voltage phasor diagram of 18-pulse converter. Explain 11th and 13th harmonics elimination in 18-pulse converter. Discuss transformer connections also. **07**
- (b) Why Multi-level inverter is required? Discuss its advantages over two level inverter. Compare different configurations of multilevel inverter in brief. **07**
- Q.2** (a) Draw circuit diagram and wave forms of five level diode clamped inverter. Explain its working. **07**
- (b) Mention advantages of H bridge multilevel inverter. Explain working of five level H bridge inverter. **07**
- OR**
- (b) Draw circuit diagram and wave forms of five level flying capacitor inverter. Explain its working. **07**
- Q.3** (a) Draw and explain two quadrant ZVS converter. Give its advantages. **07**
- (b) Discuss PUSH-PULL converter based DC power supply with neat circuit diagram. **07**
- OR**
- Q.3** (a) Explain class-E resonant inverter. Mention applications of resonant inverter. **07**
- (b) Discuss difference between ON LINE and OFF LINE UPS. Discuss control of UPS. **07**
- Q.4** (a) Discuss energy conversion in switched reluctance motor (SRM). Explain SRM drive. **07**
- (b) Discuss micro stepping control of stepper motor drive. Write its advantages. **07**
- OR**
- Q.4** (a) How unidirectional torque is obtained in SRM? Explain construction of SRM. **07**
- (b) Explain significance of position sensing in BLDC motor drive. Discuss gate signal generation logic based on position sensing. **07**
- Q.5** (a) Discuss various components used in UPS. **07**
- (b) Explain asymmetric cascaded multilevel inverter and its advantages. **07**
- OR**
- Q.5** (a) Compare ZCS and ZVS. **07**
- (b) What do mean by switch mode power supply? How is it differs from linear power supply? **07**
