

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII(NEW) • EXAMINATION – WINTER 2016

Subject Code:2170906

Date:18/11/2016

Subject Name:Advanced Power Electronics(Departmental Elective - II)

Time:10.30 AM to 1.00 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)** Discuss operation of Push pull converter type switched mode dc power supply along with necessary waveforms. **07**
- (b)** List the separate DC sources used for cascaded multilevel inverter. Explain operation of five level cascaded multilevel inverter. **07**
- Q.2 (a)** Explain operation of ZCS converter with diagram and wave forms. **07**
- (b)** Define FACTS. Give detail classification of FACTS controllers. **07**
- OR**
- (b)** Draw circuit diagram and output voltage phasor diagram of 12-pulse converter. Explain 5th and 7th harmonics elimination in 12-pulse converter **07**
- Q.3 (a)** State the advantages HVDC transmission over EHVAC transmission for bulk power transmission. **07**
- (b)** Explain the working of FC-TCR. Draw neat diagrams. **07**
- OR**
- Q.3 (a)** Discuss operation of Buck converter in continuous and discontinuous conduction mode. **07**
- (b)** Explain parallel resonant inverter with necessary diagram and wave-form. **07**
- Q.4 (a)** Explain basic principle of shunt compensation used for transmission line. Explain working of STATCOM. **07**
- (b)** With neat circuit diagram and waveform discuss class E resonant inverter. **07**
- OR**
- Q.4 (a)** Discuss importance of reactive power compensation. Discuss phase-shifting transformer with necessary diagram in brief. **07**
- (b)** Classify carrier based PWM technique for multilevel inverter. Discuss any one in detail. **07**
- Q.5 (a)** What is the difference between isolated and non-isolated dc power supply. Explain fly back converter topology with diagram and wave forms. **07**
- (b)** Discuss operation of three level diode clamped multilevel inverter. **07**
- OR**
- Q.5 (a)** Discuss operation of Cuk converter. Derive the relation between duty ratio and input voltage. **07**
- (b)** Draw the transformer connections for 18 pulse converter. Explain Y-Z2 transformer connection used for multipulse converter. **07**
