

Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 7 – EXAMINATION – SUMMER 2026

Subject Code: 3172418

Date: 08/06/2026

Subject Name: Advanced Power Converters

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

- Q.1**
- (a) Explain the concept of multilevel inverter. **03**
 - (b) State four advantages of multilevel inverters. **04**
 - (c) Explain working of 5 Neutral Point clamped multilevel inverter with necessary diagrams. **07**
- Q.2**
- (a) Define Total Harmonic Distortion. **03**
 - (b) Write a short note on Venturini method for matrix converter. **04**
 - (c) Explain 5 level flying capacitor multilevel inverter. **07**
- OR
- Q.2**
- (c) Write short note on 18 pulse converter with circuit diagram and wave forms. **07**
- Q.3**
- (a) Justify the requirement of anti-parallel diode for active switch in inverter circuits. **03**
 - (b) Draw diagram for phase shifted modulation derived gate pulses. **04**
 - (c) Write a short note on series resonant converter. **07**
- OR
- Q.3**
- (a) What is the cause of even order harmonics in inverter output? **03**
 - (b) Draw diagram for carrier shifted modulation derived gate pulses. **04**
 - (c) Write a short note on parallel resonant converter. **07**
- Q.4**
- (a) Explain N-stage step up switched capacitor converter. **03**
 - (b) Explain the concept of zero voltage switching. **04**
 - (c) Explain 5 level cascaded H-bridge type multilevel inverter in detail. **07**
- OR
- Q.4**
- (a) Explain N-stage step down switched capacitor converter. **03**
 - (b) Explain the concept of zero current switching. **04**
 - (c) Explain working of single phase step down cyclo-converter with necessary diagrams. **07**
- Q.5**
- (a) What are quasi resonant converter ? **03**
 - (b) Define modulation index and over modulation. **04**
 - (c) Explain sine triangular comparison PWM method for inverter. **07**
- OR
- Q.5**

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|---|-----------|
| (a) Which phase shifting transformer is required for 24 pulse SCR rectifier? | 03 |
| (b) Give any four applications of cycloconverter. | 04 |
| (c) Write detailed note on space vector PWM. | 07 |
