

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022****Subject Code:3170906****Date:08/06/2022****Subject Name:Advanced Power Electronics****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.

MARKS

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|------------|---|-----------|
| Q.1 | (a) Give comparison between continuous conduction mode and discontinuous conduction mode. | 03 |
| | (b) Discuss static characteristics of SVC. | 04 |
| | (c) Derive output equation for the buck-boost converter with necessary. | 07 |
| Q.2 | (a) Discuss multi output switch mode regulators. | 03 |
| | (b) What is the need of Resonant Converter? Compare Series Loaded Resonant (SLR) converter with Parallel loaded resonant (PLR) Converter. | 04 |
| | (c) Discuss discontinuous mode of operation in buck boost converter with waveforms. | 07 |
| OR | | |
| | (c) Explain zero current switching dc-dc converter. | 07 |
| Q.3 | (a) Explain the concept & need of Multi Level Inverter (MLI) | 03 |
| | (b) What are the advantages of cascaded H bridge multi-level inverter over other two topologies? | 04 |
| | (c) Explain the operation of zero voltage switching resonant converter with circuit diagram, waveform and required equation. | 07 |
| OR | | |
| Q.3 | (a) Draw schematic diagram of 12 pulse converter with transformer connection. | 03 |
| | (b) Discuss difference between series and shunt compensation. | 04 |
| | (c) Discuss sine PWM techniques used for multilevel inverter. | 07 |
| Q.4 | (a) Classification Of FACTS devices. | 03 |
| | (b) Discuss need of phase shifting transformer. | 04 |
| | (c) Explain following transformer connection with phasor diagram used in multi pulse converter. (a) Y-Z1 (b) Δ-Z1 | 07 |
| OR | | |
| Q.4 | (a) Discuss static synchronous series compensator. | 03 |
| | (b) Give comparison of HVAC and HVDC transmission. | 04 |
| | (c) Explain the operation of six pulse diode rectifier with resistive load with necessary diagram and waveform. | 07 |
| Q.5 | (a) Explain working principal of SSSC. | 03 |
| | (b) Comparison of SVC & STATCOM. | 04 |
| | (c) Discuss operation of Flyback converter. Draw its circuit diagram and waveforms. | 07 |

OR

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| Q.5 | (a) | What is the need of Reactive Power Compensation? | 03 |
| | (b) | State advantages and limitation of SSSC. | 04 |
| | (c) | Explain operating principle of Unified power flow controller (UPFC). | 07 |
