

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020****Subject Code:2170906****Date:19/01/2021****Subject Name:Advanced Power Electronics****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Give comparison between continuous conduction mode and discontinuous conduction mode. **03**
- (b) Draw only the circuit diagram of flyback, forward, half bridge and full bridge converter. **04**
- (c) Derive output equation for the buck-boost converter with necessary waveform. **07**
- Q.2** (a) Explain the use of transformer in switch mode power supplies. **03**
- (b) Classify the resonant converter. **04**
- (c) Explain the operation of two transistor forward converter with circuit diagram, waveform and required equation. **07**
- Q.3** (a) Why resonant converter is needed? **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**
- Q.4** (a) Why multi pulse converter is better than conventional converter? **03**
- (b) Give comparison between ZVS and ZCS. **04**
- (c) Draw the circuit diagram of 5 level diode clamped multi level inverter and explain the operation with switching table. **07**
- Q.5** (a) Give technical comparison between buck converter and boost converter. **03**
- (b) Explain the working of Fixed Capacitor Thyristor-Controlled Reactor (FC-TCR). Draw neat diagrams. **04**
- (c) Draw the circuit diagram of 5 level cascaded H-bridge multi-level inverter and explain the operation with switching table. **07**
- Q.6** (a) Compare SVC and STATCOM. **03**
- (b) Draw block diagram of HVDC transmission system. Mention equipment required for HVDC system. **04**
- (c) Explain the operation of six pulse diode rectifier with resistive load with necessary diagram and waveform. **07**
- Q.7** (a) Give classification and applications of phase shifting transformer. **03**
- (b) What is series compensation? Discuss working of Thyristor controlled series capacitor (TCSC). **04**
- (c) Explain operating principle of Unified power flow controller (UPFC). **07**

- Q.8** (a) Explain different types of HVDC link. **03**
(b) State advantages and limitation of SSSC. **04**
(c) Explain in brief about FACTS. **07**
