

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2022

Subject Code:2170906**Date:03-01-2023****Subject Name:Advanced Power Electronics****Time:10:30 AM TO 01:00 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
Q.1 (a) Discuss need of multi-level inverter.	03
(b) Compare linear power regulators with switching power regulators.	04
(c) Classify FACTS devices. Explain working principle of TCR.	07
Q.2 (a) Why size of switching voltage regulators are less compared to linear voltage regulators?	03
(b) Mention design criterion of SMPS.	04
(c) Discuss operation of Buck converter with circuit diagram and waveforms for R load.	07
OR	
(c) Discuss operation of C'uk converter. Draw its circuit diagram and waveforms.	07
Q.3 (a) Give classification and applications of resonant converter.	03
(b) For 3-level inverter compare cascaded H bridge topology with NPC topology.	04
(c) Discuss operation of parallel load resonant DC to DC converter	07
OR	
Q.3 (a) Draw schematic diagram and mention advantages of series load resonant converter.	03
(b) For the same source voltage, mention the voltage level at the output of cascaded 3-level H bridge inverter.	04
(c) Discuss flying capacitor topology of multilevel inverter.	07
Q.4 (a) Discuss transformer connections of multi-pulse converter.	03
(b) Discuss application of multi pulse converter. What is thyristors valve?	04
(c) Discuss any one PWM method used in three level diode clamped inverter.	07
OR	
Q.4 (a) Draw static characteristics of STATCOM.	03
(b) Mention advantages and limitations of SSSG.	04
(c) Draw neat circuit diagram and waveforms of three level diode clamped multilevel inverter.	07
Q.5 (a) Give comparison of HVAC and HVDC transmission.	03
(b) Why switching frequency of multi-level inverter kept less compared to 2-level inverter?	04
(c) Explain working principle of thyristor switched capacitor thyristor controlled reactor (TSCTCR).	07

OR

- Q.5** (a) Explain extinction angle control in HVDC. **03**
(b) Draw and explain block diagram of HVDC transmission line. **04**
(c) Discuss operating principle and application of FC-TCR. **07**
