Seat No.: Enrolment No._____

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 node 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**

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