PRN:		Course Code :	PPD302

Second Year **M. Tech** End Semester Examination Winter 2023

Modeling of Power Converters

Day and Date: Thursday 30/11/2023 Max Marks: **100**

Time : 10.30 am to 1.30 pm Duration: **03** hrs

Instructions: All questions are compulsory.

			Marks	Bloom's Level	CO
Q.1		**Attempt the following**			
	a)	Draw the Cuk converter and construct the equivalent circuit of the buck converter during Turn – on and Turn off Time.	08	L_4	CO1
	b)	Derive the matrix form of Cuk converter switch which describe the characteristics during Turn -on and Turn-off time?	08	L_4	CO1
		OR			
	b)	Design the filter capacitance of Cuk converter to produce stiff DC voltage in the output terminal?	08	L_4	CO1
Q.2		**Attempt the following**			
	a)	Draw the equivalent circuit of Buck-Boost converter during Turn on and Turn off Time?	08	L_3	CO2
	b)	Design the output capacitor of Buck-Boost converter with suitable evaluation of performance?	08	L_3	CO2
		OR			
	b)	Derive the matrix form of Buck-Boost Converter with suitable assumption?	08	L_3	CO2
Q.3		**Attempt any two from the following**			
	a)	Draw the equivalent circuit of three phase PWM Rectifier during ON and OFF time of switches?	08	L_4	CO2
	b)	Derive the model equation of Sine PWM inverter?	08	L_4	CO2
	c)	How the source inductance effect impact on the model of controlled rectifier?	08	L_4	CO2
Q.4		**Attempt any two from the following**			
	a)	Implement the parameter estimation methodology for Inverter operation?	08	L_5	CO3
	b)	Differentiate the square wave inverter model and Sine PWM inverter model?	08	L_5	CO3
	c)	Design the power supply filter for various applications?	08	L_5	CO3
Q.5		**Attempt any Two of the following**			
	a)	Design the back-to-back converter with suitable modeling?	09	L_5	CO4
	b)	Construct the flowchart to implement converter modeling?	09	L_5	CO4
	c)	Detail the types of algorithms used for the optimization through power converter modeling?	09	L_5	CO4
Q.6		**Attempt any Two of the following**			
	a)	Design the grid connected inverter with converter modeling?	09	L_6	CO3
	b)	Compare the buck regulator and buck converter modeling?	09	L_6	CO3
	c)	Differentiate Semi converter and Full converter modeling with different firing angle?	09	L_6	CO4

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