

PRAGATI ENGINEERING COLLEGE: SURAMPALEM
(AUTONOMOUS)
M.Tech II Semester Regular/Supplementary Examinations, July - 2024

SWITCHED MODE POWER CONVERSION
(PE&ED)

Time: 3 hours

Max. Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

5X12=60

Q.NO.		Question	BTL	CO	Marks
1.	a.	Draw the circuit diagram of a buck converter including non-idealities in the components. Explain the effect of non-idealities on the performance of the converter.	K2	CO1	6M
	b.	Explain the operation of Buck-Boost converter with neat circuit and waveforms in continuous conduction mode	K2	CO1	6M
2.	a.	In a buck-boost converter operating at 20 kHz, $L = 0.05$ mH. The output capacitor is sufficiently large and $V_d = 15$ V. The output is to be regulated at 10V and converter is supplying a load of 10 W. Calculate the duty ratio D.	K4	CO1	6M
	b.	Explain the operation of CUK Converter with neat circuit and waveforms	K2	CO1	6M
3	a.	Explain frequency characteristics of series and parallel resonant circuit	K2	CO2	6M
	b.	Explain the operation of a push-pull converter.	K2	CO3	6M
4	a.	Compare ZVS and ZCS topologies	K4	CO2	6M
	b.	Explain the operation of zero current switching Quasi-resonant buck converter with neat circuit and waveforms	K2	CO2	6M
5.	a.	Explain the operation of zero voltage switching quasi-resonant boost converter	K2	CO2	6M
	b.	Explain the operation of full-bridge dc-dc converter with neat circuit and waveforms	K2	CO3	6M
6.	a	Explain the design considerations in design of a DC inductor and capacitor.	K2	CO4	6M
	b	Explain the design considerations of Transformers.	K2	CO4	6M
7	a	Formulate the average model of Boost Converter.	K5	CO5	6M
	b	Derive the transfer functions for buck converter by using small signal model.	K4	CO5	6M
8	a	Explain large signal issues in voltage-mode and current-mode control.	K2	CO5	6M
	b	Obtain the gain and phase plot of the non-ideal boost converter from its transfer function.	K3	CO5	6M