

EEL844 – Major**Time: 120 minutes****Max. Marks: 45****Note: Draw neat waveforms if required**

1. Determine the output impedance of the converter shown in Fig. 1. Discuss how it is going to change if an outer voltage loop is added to this converter in order to regulate the voltage. (10)

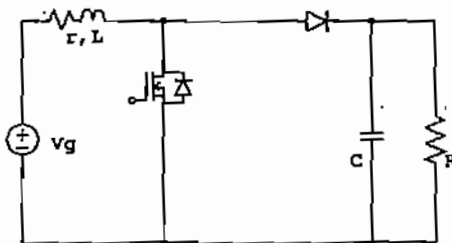


Fig.1

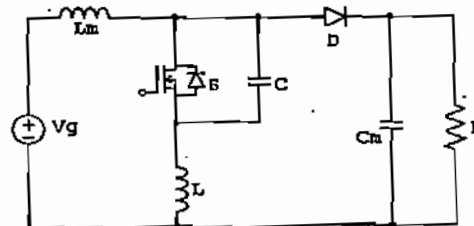


Fig. 2. ZVS-Boost converter.

2. How the amplification factor (μ) in the switch-mode dc-dc buck converter, operating in discontinuous inductor current mode, is dependent on the circuit parameters and switching frequency? Explain and establish a suitable relationship to reflect this point. (10)
3. In the soft switching converter shown in Fig. 2, determine the duration of time during which the gate signal is to be released in order to realize the ZVS-soft switching. (10)
4. For the ZCS-soft switched converter, shown in Fig. 3, determine the "minimum ON-time" of the switch. (7)

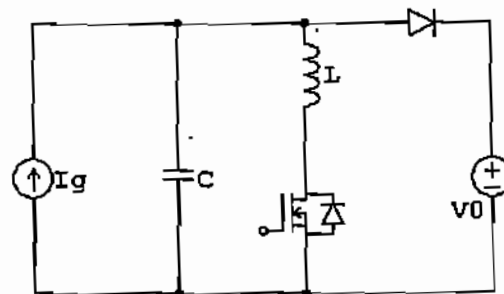


Fig. 3

5. Design the resonant circuit elements for the M-type ZCS boost converter to meet the following specifications: Source voltage (V_g)=25 V, Load power(P_o)=30 W @ 0.5 A, Switching frequency= 100 kHz, For $Q=6.0$ the relationship between converter voltage gain and normalized frequency is: $M=4.1379 \cdot f_n$ (8)

01/12/2006 (1.00 P.M -to- 3.00 P.M)