



Reg. No. :

Name :

Sixth Semester B.Tech. Degree Examination, May 2016
Branch – Electrical and Electronics Engineering
13.606.3 – SWITCHED MODE POWER CONVERTERS (E)
(2013 Scheme)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **2** marks.

1. What is the boundary between CCM and DCM in a boost converter ?
2. What are the drawbacks of linear supplies ?
3. What is meant by frequency modulation ratio and amplitude modulation ratio ?
4. What is meant by over modulation in PWM switching ?
5. Compare a series and parallel resonant circuit.
6. What is a static transfer switch ?
7. Compare ZCS and ZVS operation.
8. What is a power conditioner ? Mention the applications.
9. What is a double ended forward converter ?
10. What are the advantages of isolated dc-dc converters ? (2×10 = 20 Marks)

PART – B

Module – I

(4×20 = 80 Marks)

11. A) A buck-boost regulator has an input voltage of 12V. The duty cycle is 0.6 and the switching frequency is 25 kHz. For an inductance of $250\mu\text{H}$ and for a filter capacitance of $220\mu\text{F}$ the average load current is 1.5 A. Determine :
 - a) the average output voltage
 - b) the peak to peak output ripple voltage
 - c) the peak to peak ripple current of inductor
 - d) the peak current of transistor
 - e) the critical value of inductor. 15
- B) Explain the operation of a full bridge dc-dc converter. 5

OR

P.T.O.



12. A) Design a buck converter to produce an output voltage of 18 V across a 10Ω load resistor. The output voltage ripple must not exceed 0.5 percent. The dc supply is 48 V. Design for continuous inductor current. Specify the duty ratio, the switching frequency, the values of the inductor and capacitor, the peak voltage rating of each device, and the rms current in the inductor and capacitor. Assume ideal components. **15**
- B) Give a comparison of different dc-dc converters. **5**

Module – II

13. A) Explain the operation of a three phase inverter with a neat diagram. **15**
- B) Discuss the effect of blanking time on voltage in PWM inverters. **5**

OR

14. A) Explain in detail about current regulated modulation. **12**
- B) Explain about square wave switching scheme. **8**

Module – III

15. A) Explain the operation of a ZCS resonant switch converter with necessary figures and circuit diagram. **15**
- B) Briefly describe switch mode inductive current switching. **5**

OR

16. A) Explain a series loaded resonant dc-dc converter and its discontinuous mode of operation with neat figures. **15**
- B) Explain the frequency characteristics of a parallel resonant circuit. **5**

Module – IV

17. A) Explain the operation of a flyback and forward converter with a neat circuit diagram and operational waveforms. **15**
- B) What are the various power line disturbances and their causes ? **5**

OR

18. A) Briefly describe the operation of a half bridge converter with waveforms and equations and derive the expression for voltage. **12**
- B) Explain the operation of a push-pull converter. **8**
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