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Question Paper Code: 95S07

M.E. DEGREE EXAMINATION, JAN 2020

Elective

Electrical Engineering

19PPE507- SWITCHED MODE AND RESONANT CONVERTERS

(Regulation 2019)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

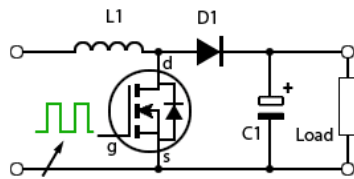
1. Which answer from the following list is a major advantage of switched mode power supplies over series regulated supplies? CO1- R
 - (a) Switched mode supplies create smaller amplitude ripple waveforms than series regulators.
 - (b) Switched mode supplies dissipate less power in the control element than series regulators.
 - (c) Switched mode supplies provide better regulation at low power than series regulators.
 - (d) Switched mode supplies work digitally, so are more efficient than series regulators.

2. In ideal Switches CO1- R
 - (a) The power dissipated in the switch in the ON and OFF states is zero.
 - (b) The power dissipated in the switch in the OFF state is zero.
 - (c) The power dissipated in the switch in the ON state is zero
 - (d) None of the above

3. Which one of the following acts as an energy store in a DC to DC Converter? CO2- R
 - (a) The inductor.
 - (b) The high frequency switching transistor
 - (c) The load
 - (d) The flywheel diode.

4. What type of circuit is illustrated in Fig

CO2- R



- (a) Buck Converter. (b) Boost Converter
(c) Buck-boost Converter (d) Flyback Converter

5. In a step down chopper using pulse width modulation, $T_{on} = 3 \times 10^{-3}$ and $T_{off} = 1 \times 10^{-3}$ s. The chopping frequency is

CO3- R

- (a) 333.33 (b) 250 (c) 500 (d) 1000

6. In current commutated DC-DC choppers, the voltage spike appears across the load when

CO3- R

- (a) Voltage across the commutating inductances collapse
(b) The capacitance voltage adds to the supply voltage
(c) Both (a) and (b)
(d) None of these

7. For a buck converter to reduce the conduction losses in diode

CO4- R

- (a) A low on - resistance switch can be added in parallel
(b) A high on - resistance switch can be added in series
(c) A low on - resistance switch can be added in series
(d) All the above

8. The conduction losses in IGBT is

CO4- R

- (a) More than that of MOSFET (b) Lower than that of MOSFET
(c) Equal to that of MOSFET (d) Equal to that of BJT

9. Voltage commutation circuit can be converted into a current commutation by interchanging the positions of

CO5- R

- (a) Capacitor and SCR (b) Inductor and capacitor
(c) Capacitor and load (d) none of these

10. The input to a controller is CO5- R
- (a) Sensed signal
 - (b) Error signal
 - (c) Desired variable value
 - (d) Signal of fixed amplitude not dependent on desired variable value

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Discuss the electromagnetic involved in designing of transformers with necessary equations. CO1- U (8)
12. Distinguish the operation of series and shunt controlled DC-DC converter CO2- U (8)
13. Discuss the various factors creates stress on a converter and how to choose the size of the switch to withstand the stress CO3- U (8)
14. Explain the operating principle and characteristics of Resonant Power Processor with neat diagram. CO4- U (8)
15. Discus the different structure of PID controllers used in DC-DC converter with necessary diagram. CO5- U (8)