KUMARAGURU
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Register Number:……..

B.E DEGREE EXAMINATIONS: NOV / DEC 2014

(Regulation 2009)

Sixth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

EIE118: Power Electronics

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which power semiconductor device out of the following is not a current triggered device?
   a) Thyristor b) GTO
   c) TRIAC d) MOSFET
2. The latching current of SCR is 18mA. Its holding current will be
   a) 6mA b) 18mA
   c) 54mA d) 12mA
3. The overlap angle of phase controlled converter would increase on increasing
   a) Supply voltage b) Supply frequency
   c) Load current d) Delay angle
4. In a 3 phase, half wave rectifier, per phase input voltage is 200V, its average output voltage is
   a) 116.95V b) 233.91V
   c) 202.56V d) 101.28V
5. In a DC chopper, which type of commutation results in best performance?
   a) Voltage commutation b) Current commutation
   c) Load commutation d) Supply commutation
6. In a DC chopper, per unit ripple is maximum when duty cycle is
   a) 0.2 b) 0.5
   c) 0.7 d) 0.4

7. A voltage source inverter is normally employed when
   a) Source inductance is large load inductance is small
   b) Source inductance is small load inductance is large
   c) Both source & load inductance are small
   d) Both source & load inductance are large.
8. There is no possibility of short circuit in current source inverter due to
   a) The input voltage is constant
   b) The input current is constant
   c) The input voltage is varied
   d) The input current is varied
9. The batteries in the ups system are in the type of
   a) Nickel cadmium
   b) Chromium
   c) Lead acid
   d) Zinc sulphide
10. The parameter which controls power in a transmission line is
   a) Varying the voltage
   b) Varying the supply frequency
   c) Varying reactance
   d) Varying the impedance

PART B (10 x 2 = 20 Marks)

11. State the advantages of IGBT over MOSFET.
12. What is the function of snubber circuit?
13. Define total harmonic distortion (THD).
14. When the Commutator is said to be operated in inversion mode?
15. What is meant by time ratio control in chopper?
16. Write any two salient features of Cuk converter.
17. What is meant by current source inverter?
18. List the different types of PWM techniques.
19. Mention the different types of HVDC link.
20. What is the function of static VAR compensator?

PART C (5 x 14 = 70 Marks)

21. a) Explain the structure, different modes of operation & characteristics of TRIAC.

(OR)

b) Describe about any one driver circuit & snubber circuit for MOSFET.

22. a) With necessary circuit & waveform, explain the principle of operation of six pulse converter (fully controlled).Derive the expression for average output voltage in it.

(OR)

b) (i) Describe the working principle of single phase AC voltage controller with necessary waveforms. (7)

(ii) Explain the effect of source inductance in the operation of single phase fully controlled converter. (7)

23. a) (i) A DC chopper has an input voltage of 200V & a load of 20 ohm. When a chopper is ON, its voltage drop is 1.5V & the chopping frequency is 10kHz.If the duty cycle is 80%, find (i) average output voltage, (ii) rms output voltage, (iii) chopper on time. (7)

(ii) Explain the chopper control techniques. (7)

(OR)

b) Discuss the operation of the resonant switching based SMPS.

24. a) Discuss the functions of three phase voltage source inverter supplying a balanced star connected load in 120 degree operation mode.

(OR)

b) (i) Explain how inverter can be controlled using Sinusoidal & Multiple PWM technique. (7)

(ii) Write short notes on series resonant inverter. (7)

25. a) Explain the construction & principle of operation of static VAR compensator.

(OR)

b) Explain the operation of on-line & off-line UPS in detail.

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