Code No. 6088 / S

FACULTY OF ENGINEERING

B.E. 3/4 (EE/Inst.) I-Semester (Suppl.) Examination, July 2014

Subject : Power Electronics

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1 What are the different types of power diodes? State the limitations of Schottky diodes. (3)
2 Compare IGBT and MOSFET. (2)
3 Explain the steady state characteristics of a GTO. (3)
4 What is the difference between Forced commutation and Line commutation? Explain. (2)
5 Explain the effect of introducing freewheeling diodes in phase controlled converters. (2)
6 Derive the expression for average output voltage of a single phase half controlled converter for R load. (3)
7 Explain any one scheme of Time ratio control of choppers. (3)
8 List the advantages and disadvantages of single phase half wave AC regulator. (2)
9 Discuss the advantages and disadvantages of a Voltage source inverter compared to a current source inverter. (3)
10 What are the advantages of sinusoidal pulse width modulation? (2)

PART – B (50 Marks)

11 (a) Explain the switching characteristics of power MOSFET. (5)
(b) Explain the dynamic characteristics of a power BJT. (5)

12 (a) Explain the over voltage and over current protection of thyristor. (5)
(b) Explain the turn off mechanism in a power MOSFET. (5)

13 Explain the working of a three phase half controlled rectifier with RLE load. Also draw the relevant waveforms. (10)

14 The step down chopper has a resistive load of R = 10 ohm and the input voltage is VDC = 200V. When the chopper is turned on, the voltage drop across the switch is 1 V, the chopper frequency if f = 1 kHz. If the duty cycle is 40%, determine (10)
(a) the average output voltage
(b) the RMS output voltage
(c) Efficiency of the chopper

15 (a) Explain the working of a single phase AC voltage controller with RL as load. (7)
(b) Write the applications of choppers and cyclo converters. (3)

16 Explain the principle of sinusoidal pulse width modulation scheme with relevant waveforms and necessary equations. (10)

17 Write short notes on the following: (10)
(a) Multilevel inverters
(b) Class-E chopper

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