R16

Code No: 136DJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, November/December - 2020
POWER ELECTRONICS
(Electrical and Electronics Engineering)

Time: 2 Hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

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1. Explain the working of IGBT. [15]

2. Explain the dynamic characteristics of SCR with necessary waveforms. [15]

3.a) A single phase 230 V, 1 kW heater is connected across single phase 230 V 50 Hz supply through an SCR. For firing angle delay of 45 degrees and 90 degrees, calculate the power absorbed in the heater element.
b) Explain the effect of source inductance in a single phase full converter. [7+8]

4. Explain the working of three phase semi converter for a firing delay angle of 45 degree. [15]

5. The three-phase full-wave A. C. voltage controller supplies a Y-connected resistive load of R = 10 Ohms and the line-to-line input voltage is 208 V (rms), 60 Hz. The delay angle is л/3. Determine a) the rms output phase voltage *Vo*, b) the input PF, and (c) the expression for the instantaneous output voltage of phase *a*. [5+5+5]

6. A single-phase full-wave ac voltage controller has a resistive load of R = 10 Ohms and the input voltage is *Vs* = 120 V (rms), 60 Hz. The delay angles of thyristors T_1 and T_2 are equal to 90 degrees. Determine (a) the rms output voltage *Vo*, (b) the input PF, (c) the average current of thyristors I_A, and (d) the rms current of thyristors. [4+4+4+3]

7. Explain the working of AC chopper with necessary circuits and waveforms. [15]

8. Explain the working of series inverter and modified series inverter with necessary waveforms and circuits. [15]

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