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Roll No .....

EE-604 (GS)

B.E. VI Semester Examination, June 2020

Grading System (GS)

Power Electronics

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. Explain with a proper circuit diagram and waveform the method of RC triggering for the gate of a thyristor that produces pulses for every positive half cycle of AC supply voltage.

2. A single-phase fully controlled bridge converter is connected to 220V, 50Hz. A load of R = 1Ω is connected in series with a large inductance and load current is ripple free. If the firing angle of converter is 60°, determine different performance parameters of the converter.

3. Explain working of single phase fully controlled bridge converter and its modes of operation. Sketch waveforms for load voltages, load current, thyristor voltages for $\alpha = 45°$ and $\alpha = 135°$ assuming continuous conditions. Draw the control characteristics of rectifier.

4. A single phase full converter supplies power to RLE load the source voltage is 230V, 50Hz and for load R = 2Ω, L = 10mH, E = 100V for firing angle 30°. Find the average value of O/P current and output voltage in case the load current extinguishes at
   i) 200°
   ii) 170°

5. Define the following terms in SCR.
   i) Forward break over voltages
   ii) Latching current
   iii) Holding current
   iv) I^2t rating

6. a) Define the term duty cycle in the method of ON-OFF control.
   b) Explain the working of a dual converter in the circulating current mode.

7. A single phase voltage controller with an RL load is connected to a 110 volts source if R = 10 ohms and L = 20 mH and α = 90 degree. Find
   i) The R.M.S. output current
   ii) The power delivered to the load
   iii) The power factor

8. Write short notes on any two of the following:
   a) Switch mode voltage regulator
   b) Mc-Murray Bed ford inverter
   c) Series and Parallel inverter
   d) Three-phase AC voltage controller

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