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Paper Code & Roll No. to be filled in your Answer Book

Roll No. | | | | | | | | | | | |

B. Tech. (VI - Sem.)

Even Semester Examination - 2016

POWER ELECTRONICS

[Time : 3 Hours]   [Maximum Marks :100]

Note : Attempt **All** Questions.

Q1.   Attempt **any Four** Questions.   (5X4=20)

     (a)   Write down different thyristor triggering methods.

     (b)   Draw and explain R-Firing circuit.

     (c)   Explain two transistor model of thyristor.

     (d)   Explain the methods of turn-on operation of GTO.

     (e)   Explain di/dt and dv/dt rating of SCR and role of snubber circuit to protect thyristor against high dv/dt.

Q2. Attempt **any Four** Questions.   (5x4=20)

   (a) What is commutation? Discuss different methods of commutation.

   (b) Explain Dynamic equalising circuit in Series operation of SCR

   (c) What do you mean by rectifier explain half wave single phase convertor for R-type load.

   (d) Describe the principal of DC chopper operation. Derive an expression for its average DC output Voltage.

   (e) Draw and explain complementary voltage commutation (class C) method of SCR.

Q3. Attempt **any Two** Questions.   (10x2=20)

   (a) Explain the four quadrant operation of Single phase Dual converter and also explain why Circulating Current scheme is better.

   (b) Explain the working of Half controlled full bridge converter, also write down their Source performance and why harmonic contents are less as compared to the fully Controlled converter.

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(c) Explain the operation of three phase full wave fully controlled converter for firing Angle = 90° if load is R-L type.

Q4. Attempt **any Two** Questions. (10X2=20)

(a) Draw and explain with suitable waveforms single phase to single phase bridge type step down cycloconverter for both continuous and discontinuous current conduction mode

(b) Derive the equation and draw waveform of output current of single phase AC Regulator with RL load.

(c) A single phase full-wave ac regulator has a resistive load of 5 Ω while the input voltage is 220 V, 50 Hz. If the required load power be 7.5 kW, find the fire angle of the thyristors. What is the rms output voltage? Find also the input power factor.

Q5. Attempt **any Two** Questions. (10X2=20)

(a) Explain the operation of a three phase bridge inverter employing 180° mode of operation. Draw wave form of phase voltage and any one line voltage assuming star connected R-L load

(b) **What is pulse width modulation discuss the various techniques.**

(c) **Explain the operation of single phase full bridge inverter. With its output voltage and output current waveform at given different loads-**

    (i) **Load is pure resistive**

    (ii) **Load is pure inductive**

    (iii) **Load is RLC under damped**

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