BRAHMA VALLEY COLLEGE OF TECHNICAL EDUCATION, ANJANERI, NASHIK

Electronics & Telecommunication Engineering Department

Prelim Exam

Sub: PEL | Date: 11/ 03/ 2014
Course: S.Y.E.J. | Time: 3 hr.
Marks: 100

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Q1. (A) Answer any SIX **(12 Marks)**

- **a)** Draw the symbols for (i) Power MOSFET (ii) IGBT
- **b)** Define the latching current (I_L) and holding current (I_H)
- **c)** Enlist the 'Turn On' methods of SCR
- **d)** Define 'commutation'. Name all the methods of commutation
- **e)** Draw the output load voltage & current waveforms for FWCR with inductive load (Bridge Config.)
- **f)** Draw the output load voltage and current waveforms for HWCR with RL- load
- **g)** Define Chopper and Inverter.
- **h)** Drew the symbols for – (i) GTO -(ii) LASCR

Q1. (B) Answer any TWO **(08 Marks)**

- **a)** Explain the V-I characteristics of IGBT
- **b)** Draw the V-I characteristics of SCR & Explain it.
- **c)** Draw and Explain the two transistor analogy of SCR
- **d)** Draw the circuit diagram of UJT relaxation oscillator. Draw the necessary output waveforms and explain it.

Q2. Answer any FOUR **(16 Marks)**

- **a)** Explain with neat circuit diagram and waveforms ' Battery charger ' using SCR
- **b)** What is the function of freewheeling diode in controlled rectifier?
- **c)** Classify the choppers. Explain step up OR step down chopper with neat diagram (Any 1 chopper).
- **d)** Explain with neat circuit diagram 1ϕ FWCR with bridge configuration with RL- load.
- **e)** Explain the construction and working of power MOSFET.
- **f)** Draw and explain the construction & working of TRIAC.

Q3. Answer any FOUR **(16 Marks)**

- **a)** Explain the construction and working of GTO.
- **b)** Explain at least two turn on methods of SCR.
- **c)** Explain the SCR triggering using PUT relaxation oscillator.
- **d)** Draw the circuit & explain the working of 1ϕ FWCR for midpoint (M2) configuration. (Centre tapped)
- **e)** Define the performance parameters of inverter.
  - (i) Harmonic Factor of Nth Harmonic (HFn)
  - (ii) Total Harmonic Distortion (THD)
  - (iii) Distortion Factor
  - (iv) Lowest Order Harmonic (LOH)
- **f)** Explain the temperature controller using SCR.

Q4. Answer any FOUR **(16 Marks)**

- **a)** Draw the block diagram of UPS & explain its concept.
- **b)** Explain the V-I characteristics of power BJT.
- **c)** Explain the working of 1ϕ HWCR with R- load. Draw the necessary waveforms.
- **d)** Draw the symbol and construction of LASCR. Explain it briefly.
- **e)** Explain the triggering circuit of SCR: Full wave RC (capacitance) firing circuit.

f) Draw the block diagram of SMPS & its concept.

Q5. Answer any FOUR **(16 Marks)**

a) Explain the various power losses in power devices.
b) Draw the circuit of class A commutation. Explain it with waveforms.
c) What is the principle of phase controlled rectifier?
d) Explain electronic timer using SCR.
e) Draw the block diagram of Power Electronic System. Enlist any two applicable areas of power electronics.
f) Write the application of : (i) SCS (ii) DIAC

Q6. Answer any FOUR **(16 Marks)**

a) Draw the circuits of class C commutation. Explain its working. (Complementary Commutation).
b) Compare natural commutation & forced commutation.
c) What is the necessity of poly phase rectifier? Explain it.
d) Enlist the applications of choppers. (any 4)
e) Enlist the applications of UPS & SMPS (2 for each).
f) Write the application of power BJT & IGBT. What are the maximum frequencies of operation for them?