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Name.....

Reg. No.....

FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION DECEMBER 2008

EC/AI 2K 506 B/PTEC 2K 505 B—POWER ELECTRONICS

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

I. (a) Define holding current is a thyristor.

(b) Explain the term "Forced Commutation" technique in a thyristor.

(c) What is the use of free wheeling diode in a converter circuit.

(d) Sketch the variation O/P voltage with respect to firing angle in 1ϕ half controlled bridge rectifier.

(e) List out the applications of cycle converter.

(f) Define the Time ratio control in a chopper circuit.

(g) Define buck regulator.

(h) List out the applications of SMPS.

(8 × 5 = 40 marks)

II. (a) Draw and explain the two transistor analogy of a SLR. Also sketch the V I characteristics.

Or

(b) With a neat sketch explain the different triggering circuits of a SLR.

III. (a) Describe the operation of a 1-phase fully controlled converter fed RL load.

Or

(b) With a neat sketch explain the 1-phase series and parallel inverter circuits.

IV. (a) A single phase AC voltage regulator with RL load has the following details :

Supply voltage = 230 V, 50 Hz R = 4Ω and WL = 3Ω .

Calculate :

(i) Firing angle range.

(ii) Maximum value of RMS load current.

(iii) Maximum power and power factor.

(iv) The conduction angle for $\alpha = 0^{\circ}$ and $\alpha = 120^{\circ}$.

Or

(b) Explain in detail speed control schemes of DC motor.

V. (a) Describe the operation of a buck regulator with a neat diagram.

Or

(b) Explain the operation of a online ups with suitable block diagram.

[4 × 15 = 60 marks]