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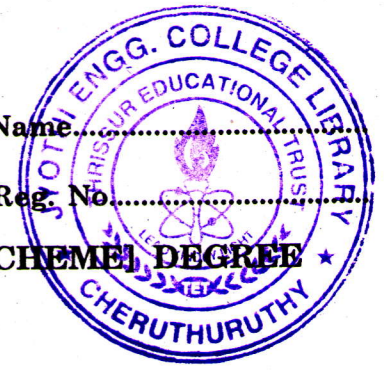
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FIFTH SEMESTER B.TECH. (ENGINEERING) [14 SCHEME] DEGREE EXAMINATION, NOVEMBER 2016

EE 14 501—POWER ELECTRONICS

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all eight questions.

I. (a) Explain the effect of gating current on VI characteristics of an SCR.

(b) Describe R triggering for a thyristor gate drive in detail.

(c) Discuss the operation of freewheeling diodes in a controlled rectifier ?

(d) Compare the dual converter with and without circulating current.

(e) Draw a neat sketch of PWM inverter. Explain its principle in detail.

(f) What is meant by positive and negative converter group in a cyclo converter ? and write its application.

(g) Compare class-A and B chopper.

(h) Distinguish the SMPS and SMPC.

(i) Explain the class - F commutation circuit for SCR.

(j) Draw and explain the reverse recovery characteristics of a power diode.

(8 × 5 = 40 marks)

Part B

Answer all questions.

II. (a) Explain the construction, operation and switching characteristics of BJT. (15 marks)

Or

(b Draw and explain the forward characteristics of SCR using two transistor model of SCR.

(15 marks)

III. (a) With a circuit and waveform explain three phase half controlled rectifier with RL load for α = 120°.

(15 marks)

Or

(b) Explain the operation of single phase dual converter with circulating and non circulating current type.

(15 marks)

Turn over

IV (a) What is Pulse Width Modulation ? Discuss any *two* of its techniques with neat diagrams.

(15 marks)

Or

(b) Discuss the working of a single phase cycloconverter with its circuit and waveform.

(15 marks)

V. (a) A step down d.c. chopper has input voltage of 230 V with 10 Ω load, voltage drop across chopper is 2V, when it is on. For a duty cycle of 0.5. Calculate (i) Average and r.m.s. value of output voltage ; and (ii) Power delivered to the load.

(15 marks)

Or

(b) Discuss the different configurations of UPS and explain them in detail.   (15 marks)

[4 × 15 = 60 marks]