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B.E./B.Tech (FULL TIME) DEGREE EXAMINATION APRIL/MAY 2011**Electrical and Electronics Engineering****V Semester****EE 375 Power Electronics****Time: 3 Hrs****Max.Marks:100****Answer All Questions****PART A (10 X 2 = 20)**

1. List out the essential qualities of ideal switch.
2. Why does the RC triggering circuit cannot be used for α close to 180° ?
3. Why the power factor is better in case of a semi converter than a full converter?
4. What is the role of free wheel and fly wheel diodes?
5. Define: Duty ratio
6. State the application of buck-boost converter.
7. Why are the online UPS costlier?
8. What are the different methods of voltage control of an inverter?
9. List out the merits and demerits of integral-cycle switching.
10. For a resistive load of an ac regulator, find the condition when THD of the line current is 100%.

PART - B (5 X 16 = 80)

11. a.i. Describe the switching characteristics of GTO. {8}
- ii. Explain the construction and working principles of IGBT. {8}

[P.T.O.]

12. a. A three phase full –wave converter in is operated from three-phase Y-connected 220 V, 50Hz supply and the load resistance is $R=20\Omega$ and $L=10mH$. If it is required to obtain an average output of 50% of the maximum possible output voltage , calculate (i) the delay angle α (ii) the rms and average output currents (iii) the average and rms thyristor currents (iv) the rectification efficiency (v) the TUF and (vi) the input PF. [16]

(OR)

- 12.b. Describe the construction and working principle of dual converter with neat sketches and wave forms. Mention its advantages and disadvantages.[16]

13. a.i. Describe different types of forced commutation techniques.[6]

ii. Compare time ratio control and current limit control.[5]

iii. Describe the working principle of resonant switching based SMPS.[5]

(OR)

- 13.b. Explain the construction and working principle of Cuk converter with necessary sketches and wave form. List out its advantages and disadvantages.[16]

- 14.a. With neat sketches and waveforms explain the conduction scheme of 120° of a three phase inverter with R load.[16]

(OR)

- 14.b.i. Describe different types of PWM techniques.[6]

ii. Explain the working principle of Off-line and Online UPS. [10]

- 15.a.i. Explain the multistage sequence control techniques.[10]

ii. Mention the advantages, disadvantages and application of Cyclo converters. [6]

(OR)

- 15.b. Explain the construction and working principle of 3 phase to single phase cyclo converter. Draw the necessary waveforms and sketches. Mention its advantages, disadvantages.[16]
