Reg. No. : | | | | | | | | | | |

Question Paper Code: 31351

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fifth Semester

Electrical and Electronics Engineering

01UEE501 - POWER ELECTRONICS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Compare latching and holding current of SCR.
2. What is secondary breakdown?
3. Why freewheeling diodes are preferred in rectifier circuits?
4. State the significance of ripple factor.
5. Comment on forced commutation.
6. What are the two types of control strategies in dc-dc chopper?
7. Define harmonics.
8. Define modulation index of SPWM Technique and state its significance.
9. List out the controls employed in cyclo converter.
10. What are the disadvantages of unidirectional or half-wave ac voltage controller?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain briefly about the snubber circuit. (8)

(ii) Explain the turn-on characteristics of an SCR. (8)

Or

(b) Draw and explain the switching characteristics of IGBT with neat diagrams. (16)

12. (a) Describe the two modes of operation of single-phase full converter with inductive load. (16)

Or

(b) Describe the operation of a three phase semi converter feeding highly inductive load with relevant diagrams and derive the expression for average and *rms* value of output voltage. (16)

13. (a) Describe with neat sketch, the principle of operation of step-up chopper. Derive an expression for the average output voltage in terms of input dc voltage and duty cycle. State the assumptions made. (16)

Or

(b) Describe the operation of voltage commutated chopper with relevant diagrams. (16)

14. (a) With neat sketches describe the working of three-phase inverter using 180 degree mode. (16)

Or

(b) Explain different methods of Harmonic control in inverters. (16)

15. (a) Discuss the operation of single-phase step-up and step-down cyclo converter. (16)

Or

(b) Illustrate the following

(i) Single phase to Three phase cyclo converter. (8)

(ii) Matrix converter. (8)

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