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

Question Paper Code: 52521

M.E. DEGREE EXAMINATION, MAY 2017

Second Semester

Power Electronics and Drives

15PPE201 - ANALYSIS OF INVERTERS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 20 = 100 Marks)

1. (a) (i) Explain with the help of waveforms the operation of a single phase half bridge inverter. (12)

(ii) List techniques employed for the reduction of harmonics from the output voltage of an inverter. (4)

(iii) Explain the need of connecting diodes in anti-parallel with switches. (4)

Or

(b) (i) Describe modified McMurray half bridge inverters with appropriate voltage and current waveforms. Derive the expressions for the commutating components L and C. (12)

(ii) What are the advantages and disadvantages of PWM? (4)

(iii) Draw circuit of auxiliary-commutated single phase bridge inverter. (4)

2. (a) (i) With necessary diagram describe the space vector modulation used to control the output voltage of three phase inverter . (12)

(ii) Draw the sinusoidal pulse-width modulation of three phase inverter. (4)

(iii) Explain limiting factor for the operating frequency of an inverter. (4)

Or

(b) (i) With necessary diagram describe the sinusoidal, multi pulse used to control the output voltage of three phase inverter (12)

(ii) Draw the basic diagram of three phase bridge inverter. (4)

(iii) Define harmonic conduction by single-pulse width modulation. (4)

3. (a) (i) Describe elaborately the single phase auto sequential commutated CSI with relevant mode d diagrams and waveforms. (12)

(ii) What is partial and full overlapping in a three phase auto sequential commutated inverter. (4)

(iii) Compare VSI and CSI. (4)

Or

(b) (i) Describe in detail the operation of load commutated inverter. (12)

(ii) What are the applications of CSI? (4)

(iii) What is the purpose of hysteresis modulation. (4)

4. (a) (i) With neat diagram describe the operation of cascaded multilevel inverter. (12)

(ii) What are the features of cascaded inverter? (4)

(iii) List the applications of multilevel inverter. (4)

Or

(b) (i) Drive and explain the flying capacitor multilevel inverter. (12)

(ii) What does the capacitor voltage UN balancing means? (4)

(iii) What are the advantages and disadvantages of flying capacitor? (4)

5. (a) (i) Drive and explain the series resonant inverters with unidirectional switches. (12)

(ii) List the advantages of parallel resonant inverters. (4)

(iii) Define Class E resonant inverter. (4)

Or

(b) (i) Drive and explain the frequency response of series resonant inverters . (12)

(ii) Explain the principal of zero-voltage switching resonant converters. (8)