Registration No. | | | | | | | | | |

M.E./M.Tech. Degree Examinations, January 2017

First Semester

POWER ELECTRONICS AND DRIVES

PD16103 – ANALYSIS AND DESIGN OF INVERTERS

(Regulation 2016)

QP Code: 163172

Time: Three hours **Maximum : 100 marks**

Answer **ALL** questions

PART A - (10 X 2 = 20 Marks)

1. Name the various PWM technique used in single phase inverters.
2. State the advantages of IGBT over MOSFET?
3. Write the functionality difference between feedback diode and freewheeling diode?
4. Mention different types of voltage control of three phase inverter?
5. Compare VSI with CSI. (Any two)
6. Write the various application of load commutated inverter and draw the basic diagram.
7. Draw the circuit diagram of five-level flying capacitor of single phase inverter?
8. What is back to back intertie system?
9. What do you mean by resonant pulse converter?
10. Write the various advantages of resonant converter?

PART B - (5 X16 = 80 Marks)

11. (a) A single phase bridge inverter has a resistive load R=2.4 ohm and the DC input voltage of 48 V. Determine **(16)**

a) RMS output voltage at fundamental frequency. b) Output power c) Iav and Im of each transistor d) Peak reverse blocking voltage of each transistor e) HF and DF at the LOH.

(OR)

(b) Explain in datail the different techniques adopted to eliminate harmonics which are generated by inverter circuits. **(16)**

12. (a) Explain the working of 180 degree conduction mode operation of three phase inverter with circuit diagram and waveforms for star and delta connected load. **(16)**

(OR)

(b) With the necessary diagram, describe the single and multi pulse used to control the output voltage of the three phase inverter. **(16)**

13. (a) Describe elaborately the single phase auto sequential commutated CSI with relevant mode diagrams and waveforms. **(16)**

(OR)

(b) Explain the operation of six step current source inverter in detail with different modes diagram when load id inductive load. **(16)**

14. (a) Derive and explain the flying capacitor multilevel inverter with necessary wave forms. **(16)**

(OR)

(b) With neat diagram describe the operation of cascaded multilevel inverter. Also explain applications of multilevel inverter as well as its merits. **(16)**

15. (a) Write down the various methods for voltage control of series resonant inverters? Explain any one method in details. **(16)**

(OR)

(b) (i) Describe the operation of Class E resonant rectifier with neat wave forms. **(12)**

(ii) Write the difference between series and parallel resonant inverter. **(4)**