Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: VII (Electrical Engineering)

Regular Examination Nov- Dec 2015

Subject:Advanced Power Electronics (2EE 721)

Time: 3 Hours **Total Marks: 70**

Instruction: 1 Draw neat sketch wherever required.
2 Assume suitable data if required.
3 Figures to the right indicate full marks.

Section - I

Que.–1 (a) Why gate drive circuit is required? Discuss use of pulse transformer for the same. 6

(b) Distinguish linear voltage regulators with switched mode voltage regulators. Explain working principle of boost converter with neat sketch and waveforms. 6

OR

Que.– 1 (a) What are Opto-isolators? Explain gate drive circuit for IGBT. 6

(b) Explain working principle of buck- boost converter with neat sketch and waveforms. 6

Que.– 2 (a) Distinguish multi pulse converter and multi level converter. Explain transformer connections of 12 pulse converters. 5

(b) Explain working principle of CUK converter with neat sketch and waveforms. 6

OR

Que.– 2 (a) With neat circuit diagram explain working principle of 18 pulse converters. 5

(b) Explain working principle of SEPIC converter with neat sketch and waveforms. 6

Que.–3 Attempt any two: 12

(a) Explain zero crossing detection principle.

(b) Mention different schemes for gate firing. Explain any one.

(c) Explain applications of DC-DC converters.

Section – II

Que.– 4 (a) Explain sine PWM technique. Draw harmonic profile of the same for the ratio $f_c/f_m = 15$. 12

(b) What is carrier based PWM technique. Explain it in details.

OR

Que.– 4 (a) What is PWM? Why is it required? Discuss hysteresis band PWM controller. 12

(b) Discuss concept of SVPWM technique. How it is better than sine PWM technique?

Que.– 5 (a) Distinguish CSI and VSI. Discuss their applications. 5

(b) Explain 3 level flying capacitor inverter. 6

OR

Que.– 5 (a) Distinguish line commutated inverters and load commutated inverters. Discuss their applications. 5

(b) Explain 3 level diode clamped inverter. 6

Que.– 6 Attempt any two: 12

(a) Explain reduction of harmonics in inverter output voltage.

(b) Explain 3 level cascaded H bridge inverters.

(c) Discuss 3-phase series inverters.

END OF PAPER