# 國 立 臺 北 科 技 大 學

## 九十二學年度電機工程系博士班入學考試

## 電力電子（電機甲組）試題

注意事項：

1. 本試題共【5】題，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在答案卷之答案欄內，否則不予計分。

1. (1).What is the difference between "Class A-" and "Class B-" limit lines of EMI regulations? (10%)

   (2). What are the advantage(s) and disadvantage(s) for using square-wave control? (10%)

2. If the reference voltage vector are given by Fig. 1. Derive the **vector times**, T2 and T3, for the voltage vectors, **V2** and **V3**, respectively, for **space vector modulation**. In Fig. 1, $V_n$, n = 1,...,6, indicates the voltage vectors associated with inverter switching states, for example, $V_3$= voltage vector for switching state (101), and the inverter is with DC-link voltage indicated by $V_{dc}$. (20%)
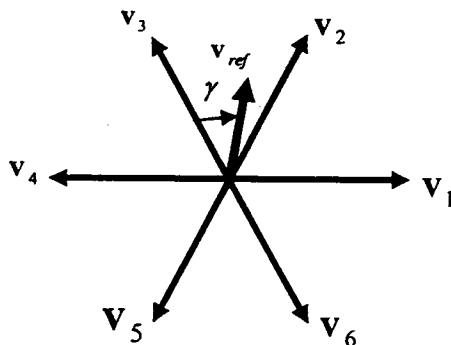


Fig. 1

3. (1). What is the difference between "PAM" and "PWM" techniques for inverter control? (10%)

   (2). What is (are) the advantage(s) of two-phase PWM technique as compared to three-phase one? How can we take this (these) advantage(s) for high temperature protection of inverter control? (10%)

4. (1). What is "synchronous rectifier"? (10%)

   (2). What is (are) the advantage(s) of synchronous rectifier as compared with conventional rectifier? (10%)

5. (1). What are current-mode control and voltage-mode control? (10%)

   (2). Which is suitable for a DC/DC converter with the feature of fast dynamic response? Why? (10%)