國 立 臺 北 科 技 大 學

一〇五學年第二學期電機系博士班資格考試

電力系統保護與協調 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. 全部答案均須答在試卷答案欄內，否則不予計分。
4. 考試時間:二小時。

1. How to use three current transformers (CTs) and three voltage transformers (VTs) to detect zero-sequence current and voltage for ground fault protection ? Draw the CTs, VTs and ground relays wiring connection diagram and illustrate how to obtain the zero-sequence current and voltage. (20%)
2. Draw the high impedance grounding scheme of large generator neutral point. Based on this grounding scheme, describe how to implement the stator ground-fault protection for generator (20%)
3. What is the magnetizing inrush current of transformer ? Describe the detrimental effects of magnetizing inrush current on transformer differential protection, and list the typical solution methods. (20%)
4. Consider the Δ-Y transformer bank with single phase to ground fault at Y side (secondary side), show that the line current magnitude (in pu) in the primary (Δside) is only 57.7% of the secondary current by symmetrical components calculation. (20%)
5. The three-phase induction motor is very sensitive to negative sequence voltage, describe this phenomenon by the simplified equivalent circuit diagram of induction motor. How to evaluate the total heating in the motor considering both positive and negative sequence currents effects. (20%)