國 立 臺 北 科 技 大 學

九十八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【4】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. Describe the cause of transformer magnetizing inrush current and the mitigated methods for preventing the miss-trip of transformer differential protection. (25%)

2. Consider an individual transformer bank with primary and secondary breakers, and the winding connection is primary-delta secondary-wye-grounded ($\triangle／Y$).

   (1).Draw the single-line diagram which includes the transformer bank, breakers, and various protection relays. The protection relays shall cover differential protection, overload-through-fault protection, ground fault protection, thermal protection and sudden pressure protection. (15%)

   (2).Depict the requirement of coordination between the protection relays based on the single-line diagram. (15%)

3. Consider the unit generator with high-impedance grounding for stator winding neutral which is done by a distribution transformer and a resistor connected to the secondary side of transformer. How to implement the protection for stator ground fault covering 100% winding ? (25%)

4. Consider a single breaker-double bus with four circuits, and one bus tie breaker. (20%)

   (1). Draw the bus arrangement and the bus differential protection zones; (8%)

   (2). In Taipower substations, what voltage levels of buses using this bus arrangement are they ? (5%)

   (3). If a line (circuit) breaker is bypassed and the bus tie breaker substituted using one bus as a transfer bus, write the procedure for operating the associated switches, breakers and relays. (7%)