

國立臺北科技大學

一百零二學年第一學期電機系博士班資格考試

電力系統故障與分析 試題

第一頁 共一頁

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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. A 60-Hz generator is rated 200 MVA, 22 kV, with $X_d''=25\%$. It supplies a load of 100MW, 0.8 power factor lagging at 20 kV. The load is connected directly across the terminals of the generator. If a three-phase short circuit occurs on the terminals of the generator, find the subtransient current magnitude in the generator in per unit on a base of 200 MVA, 20 kV. (20%)
2. A generator is rated 550 MVA, 18 kV, with reactances of $X_d''=25\%$, $X_d'=50\%$, and $X_d=100\%$. It is operating at load of 440 MW, 0.8 power factor lagging and terminal voltage 18kV when a symmetrical three-phase fault occurs at the terminal. Find the magnitudes of subtransient current, transient current and steady-state current in kA in the generator during fault. (25%)
3. Two identical generators are paralleled to supply a purely resistive load of 25 MW at 11.4 kV. One of the generator is supplying 15 MW with power factor 0.8 (lag.). Each generator is rated 20 MVA, 11.4 kV, with $X_d''=20\%$. If a three-phase short circuit occurs on the terminals of the load, find the subtransient current magnitude in kA in each generator. (The line impedances between each generator and load are neglected.) (25%)
4. A generator is rated 500 MVA, 18 kV, with positive, negative and zero sequence reactances of 20%, 20% and 10%, respectively. It is Y-connected and solidly grounded and operating at rated voltage at no load. Find the line current magnitudes of each phase for the line-to-ground (phase-a to ground) fault and line-to-line (phase-b to phase-c) fault, respectively. (The grounded impedance is neglected.) (30%)

