



Birzeit University
Faculty of Engineering and Technology
Department of Electrical and Computer Engineering
Protection and Automation in Electrical Power Systems
ENEE 5306

Midterm Exam – Part 1

8 May 2021

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Time: 25 min

Student Name:

ID Number:

Question # 1: Overcurrent relays [40 points]

An 11-kV, 50-Hz radial system is shown in Fig. 1. Assuming a CO-7 relay with relay characteristic given in the last page, **select relay settings (current tap settings and time-dial settings)** to protect the system. The breaker operating time is 5 cycles. Assume a **0.3x** second coordination time interval.

Note that coordination time interval and the loads power factor (p.f.) contain variable term x, x is the last digit of your university ID Number, **for example if your ID is 1172025**, then

- ✓ **x=5**
- ✓ The coordination time interval= **0.35**,
- ✓ p.f for load L3=0.9**5** , p.f for load L2=0.8**5** , p.f for load L1=0.9**5**

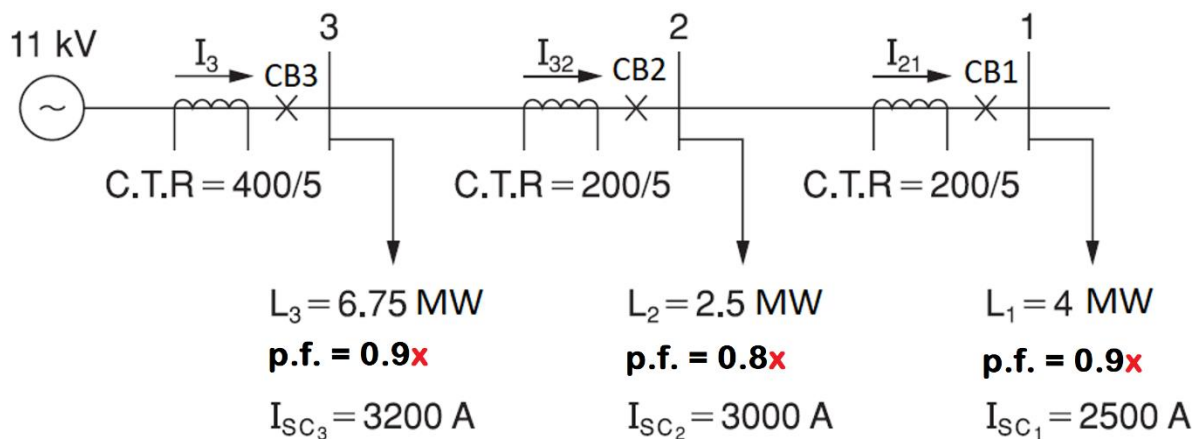


Fig. 1: Single Line Diagram for question # 1

