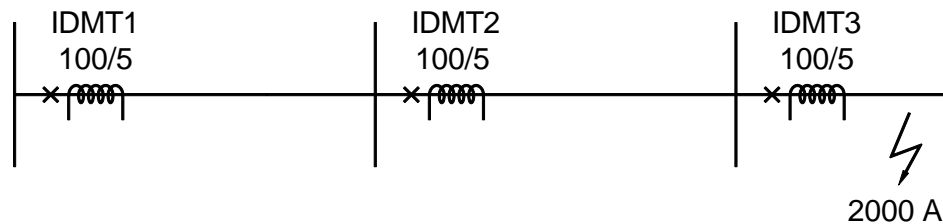UNIVERSITY OF THE WITWATERSRAND
SCHOOL OF ELECTRICAL AND INFORMATION ENGINEERING
ELEN4018: POWER SYSTEMS
TUTORIAL 5: IDMT RELAYS AND DISTANCE PROTECTION

Question 1

Consider the following network with a fault current of 2000 A at the position shown

Assuming a rated load current of 100 A select suitable IDMT settings (current multipliers and time multipliers) for the three IDMT relays (standard inverse curve). Assume a time grading of 300 ms.
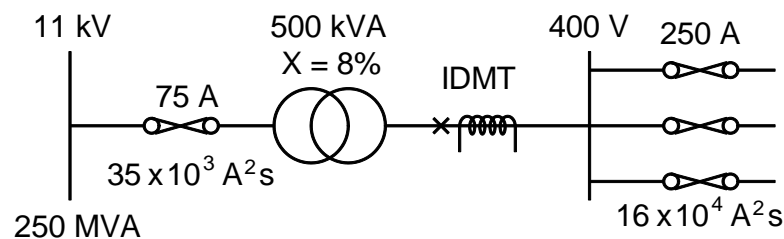
Question 2

Consider the network below
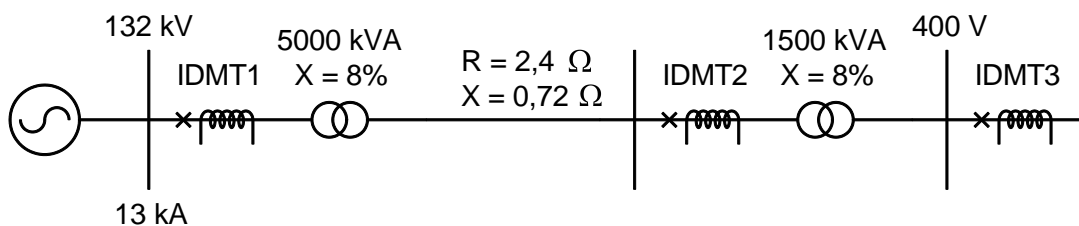
Select suitable CT ratings and settings for the IDMT relays (standard inverse curves) as well as high set instantaneous overcurrent settings. Assume a time grading of 300 ms.
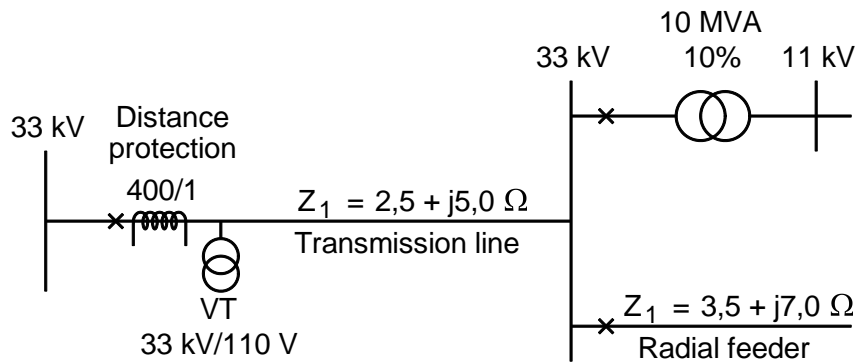
Question 3

Consider the network below

Choose a suitable CT ratio and IDMT settings (extreme inverse characteristic) to coordinate with the I^2t characteristics of the fuses (first explain what is meant by coordination for the above situation).

Question 4

Consider the network below

Select suitable distance protection settings (secondary ohms and timer settings) such that

– Zone 1 protects 80% of the transmission line
– Zone 2 protects to 50% along the radial feeder
– Zone 3 provides backup protection for the downstream transformer

Consider only balanced three-phase faults. Assume a Mho characteristic.

Dr JM Van Coller, 2017