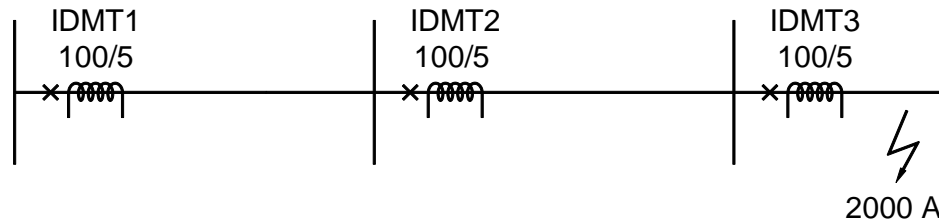


UNIVERSITY OF THE WITWATERSRAND  
SCHOOL OF ELECTRICAL AND INFORMATION ENGINEERING  
ELEN4018A/ELEN5008A: POWER SYSTEMS  
TUTORIAL 5: IDMT RELAYS AND DISTANCE PROTECTION

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Question 1

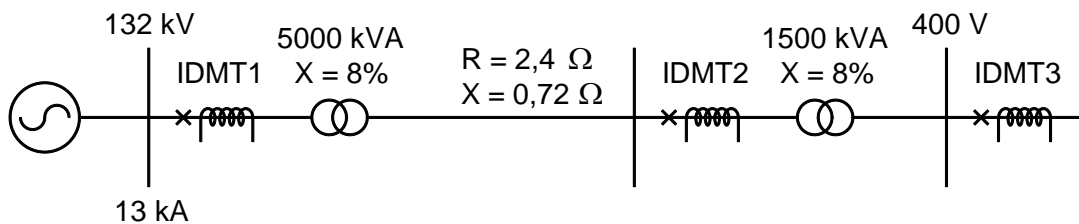
Consider the following network with a fault current of 2000 A at the position shown



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

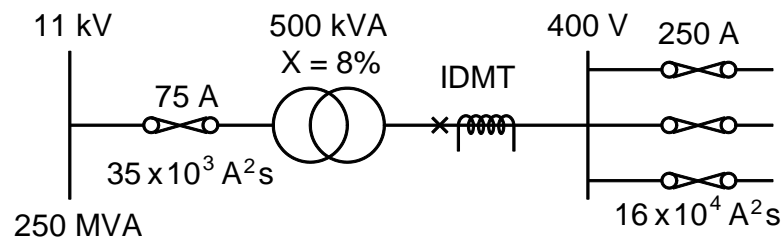
Consider the network below



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

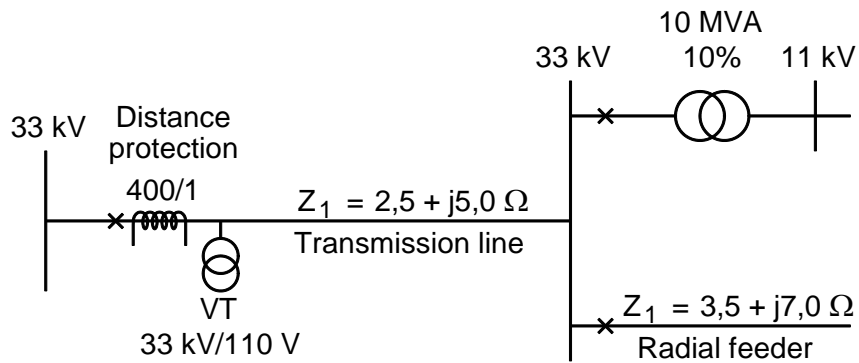
Consider the network below



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, 2018