

COLLEGE OF ENGINEERING & TECHNOLOGY

Department: Electrical & Control Engineering

Lecturer : Dr. Mohamed Elgamal

Course : Power System Protection (I) Starting Time:

Course Code: EE442

Marks: 40

Date : 31 / 5 / 2015

Time: 2 hours

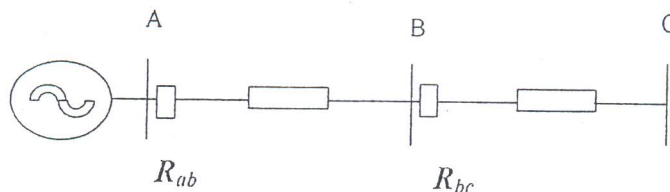


Final Examination Paper

Answer the following questions:

1. A distance relaying system utilizing a CT with a turns ratio of 500:5 and a PT with a turns ratio of 20KV:69.3V; The lines AB and BC has an impedance of $(0.03+j0.4)\Omega/\text{Km}$, the lengths of lines AB and BC are 100 Km and 80 Km. Draw each zone settings on the distance/impedance time diagram and find the response times of main and backup protection for a symmetrical short circuit at 90% of line BC.

[A4] (8 Marks)



2. a. Define the following expressions:

- Restriking voltage of a circuit breaker.
- Vacuum arc in vacuum circuit breaker.
- Prospective current of a fuse.

[A8 B3] (3 Marks)

2. b. State some of the advantages of sulfur hexa fluoride gas as an arc extinguishing medium in SF₆ circuit breakers.

[A8 B3] (3 Marks)

3. An induction disc relay, designed to perform as an over current relay. The spring torque τ_s is 0.00125 N.m and the pickup current of the relay is 8 A:

Find the constant of proportionality K1 of the relay?

If the moment of inertia of the disc is $2 \times 10^{-4} \text{ kg m}^2$ and assuming that the contacts will make after 3 degrees find the time taken by the relay to make its contacts when 2.5 times the rated current is flowing in the relay?

[C5 B3] (6 Marks)

Members of course Examination Committee:	Signature	Date:
Lecturer: Dr. Mohamed Elgamal	<i>Mohamed Elgamal</i>	31/5/2015
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