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Roll No ....

MEPS/MTPS/MTPA/MEHP - 103
M.E./M.Tech., I Semester
Examination, June 2016

Advance Power System Protection Relays

Time : Three Hours

Maximum Marks : 70

Note : i)   Attempt any five questions.
ii)   All questions carry equal marks.

1. a)   Explain the working principle of directional and non directional type over current-relay.

 b)   Explain the construction, working principle and characteristics of reactance relay type distance relay.

2. a)   Derive the torque equations for the induction type relays.

 b)   Explain clearly the basic principle of operation of a percentage differential relay for
 i)   internal fault
 ii)   for external fault.

3. a)   List the advantages and disadvantages of static relays.

 b)   Explain the duality between amplitude and phase comparators.

4.   Write short note on :
 a)   Square wave generator
 b)   Level detectors
 c)   Sampling circuit
 d)   Output-device

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5. a)   Why conventional differential protection cannot detect inter-turn faults an the same phase- and what type of protection is used for inter-turn fault in case of generator.

 b)   What causes loss of prime mover? Explain.

6. a)   Discuss the behaviour of a CT in deep saturation. What are its implications for the bus bar differential protection?

 b)   Define stability ratio and discuss its significance. What is the typical range of values of stability ratio for a high impedance bus bar differential scheme.

7. a)   Explain a biased differential protection scheme applied to three phase transformer with diagram.

 b)   Describe a Buchholz relay and discuss its merits and draw backs.

8. a)   Describe the realisation of a directional over current relay using microprocessor.

 b)   Derive the mathematical model of an elliptical distance relay and describe its realisation using a microprocessor.

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