Total number of printed pages – 4 B. Tech
CPEE 5402

Seventh Semester Examination - 2008

## POWER SYSTEM PROTECTION

Full Marks - 70

Time: 3 Hours

Answer Question No. 1 which is compulsory and any five from the rest.

The figures in the right-hand margin indicate marks.

Answer the following questions :

2×10

- How doeslinearcouplerdifferfrom ordinary
  CTs ?
- What is magnetising inrush current in Transformer?
- (iii) What are incipient faults in Transformers?

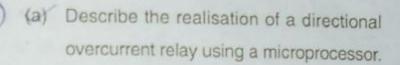
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IWL

- (iv) What is field suppression in connection with Alternator ?
- (v) What is hybrid comparator ?
- (vi) Write the essential components of a static relay.
- (vii) What are the advantages of numerical relay over conventional relays?
- (viii) Draw the block diagram of a Numerical relay.
- (ix) Discuss the role of anti-aliasing filter in numerical protection.
- (x) Explain the need for a three stepped distance protection of a transmission line.
- Discuss about synthesis of Quadrilateral

  Distance Relay.

  10
- Explain the FIR and IIR filters with neat diagram and give a comparison between them. 6+4



- (b) Draw the three step MHO characteristic for two cases 4
  - (i) 3rd zone unit placed at near end A
  - (ii) 3rd zone unit placed at remote end B.

Discuss in detail the phase comparison carrier current Protection.

- (a) Discuss about Modified Differential Protection for Generators. 6
- A 3 phase, 10 MVA, 6.6 kv star connected generator is protected by the current balancing system of Protection. If the ratio of current transformers is 1000/5, the minimum operating current of the relay is 0.5A and the neutral point earthing resistance is 5 Ω, determine the percent-

age of each phase of stator winding, which is protected against earth faults when the machine is operating at normal voltage.

4

- 7. a Discuss about Percentage Differential Relay with Harmonic Restraint in connection with Transformer Protection.
  - (b) Discuss about incipient faults in Transformers.

Discuss about Differential Protection of Busbars.

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\*(b) Discuss about Protection of Parallel feeders and ring mains.

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