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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.

1. Answer the following questions : 2×10
- ✓(i) How does linear coupler differ from ordinary CTs ?
 - ✓(ii) What is magnetising inrush current in Transformer ?
 - ✓(iii) What are incipient faults in Transformers ?

P.T.O.

(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.

2. Discuss about synthesis of Quadrilateral Distance Relay. 10

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

4. (a) Describe the realisation of a directional overcurrent relay using a microprocessor. 6

(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.

5. Discuss in detail the phase comparison carrier current Protection. 10

6. (a) Discuss about Modified Differential Protection for Generators. 6

(b) 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.

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✓ 7. (a) Discuss about Percentage Differential Relay with Harmonic Restraint in connection with Transformer Protection. 6

(b) Discuss about incipient faults in Transformers. 4

✓ 8. (a) Discuss about Differential Protection of Busbars. 5

* (b) Discuss about Protection of Parallel feeders and ring mains. 5

