EE

Total number of printed pages : 4

B. Tech

CPEE 5402/5404

Seventh Semester Examination – 2006

POWER SYSTEM PROTECTION

Full Marks : 70

Time : 3 Hours

*Answer question No. **1** which is compulsory and any **five** of the remaining questions.*

The figures in the right-hand margin indicate marks for the questions.

1. Answer the following questions : 2×10

   (i) Write the Warrington formula for the Arc Resistance, when the fault resistance is nothing but the resistance of the arc which is formed as a result of the flashover.

   (ii) Why is back-up protection needed ?

P.T.O.

(iii) What are the advantages and pitfalls of high speed protection ?

(iv) What is meant by Aliasing in connection with Numerical Protection ?

(v) Define the characteristics of Amplitude Comparator.

(vi) Draw the typical distance characteristics of Mho and Offset Mho relay.

(vii) What is a Carrier Blocking scheme ?

(viii) Write about blinders in connection with Mho relay.

(ix) Write about Time Grading for Radial Feeder.

(x) Write the effect of CT saturation on Ratio Error and Phase Angle Errors.

2. (a) Write in brief about three stepped distance protection with neat diagrams. 6

(b) Draw the following circuits : 2×2

(i) Three-stepped distance protection using Mho relay.

(ii) Trip contact circuit of the three stepped distance scheme.

3. (a) Discuss about the various abnormal operating conditions to which a modern turbo alternator is likely to be subjected. 7

(b) Write about protection against loss of excitation using offset Mho relay. 3

4. (a) Sketch the high impedance busbar differential protection for a three phase busbar having three incoming and two outgoing feeders. 5

(b) With a neat diagram write about protection against generator rotor faults. 5

5. (a) Narate the percent differential relay with Harmonic Restraint, in connection with the Transformer protection. 5

(b) Write the synthesis of Mho Relay using an Amplitude Comparator. 5

6 (a) Draw the block diagram of a Numerical Relay and discuss the working principle. 5

(b) Discuss about Numerical Over-current protection with the help of the flow chart. 5

7. (a) Write about Earth Leakage Protection. 5

(b) Discuss about Directional Over-current Relay with the help of a neat diagram. 5

8. (a) Discuss in brief about Protection System transducers. 5

(b) In connection with carrier aided protection of transmission lines write about permissive under-reach transfer tripping scheme and permissive over-reach transfer tripping scheme. 5