Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MEHP/MEPS/MTPS-103

M.E./M.Tech., I Semester

Examination, December 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 clearly the basic principle of operation of a differential relay for an internal fault.
   b) Explain the principle of distance relays stating clearly the difference between impedance relay, reactance relay and mho-relay Indicate the difference on R-X, diagram and show where each type is suitable.

2. a) What are the merits and demerits of static relays over electromagnetic relays? State the applications of static relays.
   b) Enumerate different static relays.

3. With reference to the static relays discuss the following :
   a) Amplitude comparator
   b) Phase comparator
   c) Level detectors
   d) Time delay circuits
   e) Use of operational amplifier

4. a) What are the common types of generator faults? How is the generator stator protected against and in-turn fault?
   b) Explain the principle of Merz-Price system of protection used for power transformers. What are the limitations of this scheme?

5. Describe with block diagram the construction and principle of operation of a microprocessor based percentage differential relay scheme for the protection of a power transformer.

6. a) Name the various schemes of bus bar protection.
   b) Describe briefly the following carrier distance. protection schemes used in transmission lines :
      i) Carrier transfer
      ii) Carrier blocking
      iii) Carrier acceleration

7. What are the modern trends in power system protection? Discuss the different types of digital and computer aided relays.

8. Write short notes on any two of the following :
   a) Under and over frequency relays
   b) Zener diode phase comparator
   c) Digital relaying
   d) Schemes of protection for feeders

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