

**IV B.Tech I Semester Supplementary Examinations, April/May 2005**  
**POWER SYSTEMS-III**

**(Electrical & Electronic Engineering)**

**Time: 3 hours**

**Max Marks: 70**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) A 500 kV, 2microsecond rectangular wave travels on a line having a surge impedance of 350 Ohm and approaches a termination with a capacitance C equal to 300 pF. Determine the magnitudes of the reflected and transmitted waves.  
(b) From fundamentals obtain the expressions for reflection and transmission coefficient on a line terminated with load impedance equal to the surge impedance of the line.
2. (a) Explain about surge absorbers.  
(b) What are the types of surge arresters?  
(c) What is the relation between neutral earthing and selection of voltage rating of the lightning arrester ?
3. What are the various types of SF6 circuit breakers. Explain them in detail with a neat sketch.
4. Explain direct testing of circuit breakers with a neat diagram
5. (a) Describe briefly some important types of electromagnetic attraction relays.  
(b) Describe the various steps for calculating the actual relay operating time.
6. (a) Where are the relays having extremely inverse and very inverse characteristics used? What types of characteristics are used for protecting rectifiers ,and for replacement of fuses?  
(b) Explain how the mho characteristic realized using a sampling comparator?
7. With the help of neat sketches explain the protections of a star – delta power transformer,against the following abnormal conditions
  - (a) phase to phase fault
  - (b) earth fault
  - (c) high voltage surges
8. (a) Discuss the considerations which determine the need for a busbar protection.  
(b) Discuss any one busbar protection scheme in detail.

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