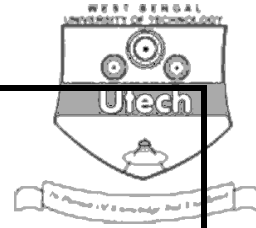
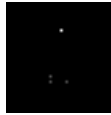


[ Full Marks : 70



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**CS/M.TECH (EE)/SEM-2/MEE-202/09**  
**PROTECTION OF POWER SYSTEM AND APPARATUS**  
**SEMESTER - 2**



Full Marks : 70

Time : 3 Hours ]

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

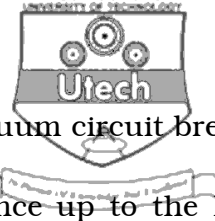
Answer any *five* of the following.

5 × 14 =

1. a) Explain in the light of the generalized theory, the complex plane characteristics obtained by a 2-input amplitude comparator. 7  
b) Explain the duality between a 2-input amplitude comparator and 2-input 90° phase comparator. 7
2. a) State the working principle of a multi-input coincidence comparator. 7  
b) How is block average type 2-input 90° comparator designed ? 7
3. How does power swing affect the operation of a distance relay ? What is the remedial measure against it ? 14
4. a) How is a Mho characteristic of distance relay designed with the help of a 90° phase comparator ? 7  
b) Design a quadrilateral characteristic of distance relay by asymmetric phase comparators. 7
5. a) Discuss briefly the advantages of Digital Relay over its A.C counterpart. 7  
b) With necessary schematic diagrams discuss the function of Measurement sub-unit and Evaluation sub-unit of Digital Protection scheme. 7



6. Develop an algorithm for finding out R & L ( Resistance & Inductance ) of a transmission line. 14
7. a) Discuss the construction, operating principle of vacuum circuit breaker. 7
- b) For a 132 kV system, the reactance and capacitance up to the location of the circuit breaker is  $3\Omega$  and  $0.015 \mu\text{F}$  respectively. Calculate the following :
- i) The frequency of transient oscillation.
- ii) The maximum value of restriking voltage across the contacts of the circuit breaker.
- iii) The maximum value of RRRV. 7
8. Write short notes on the following : 7 + 7
- a)  $\text{SF}_6$  . Circuit Breaker.
- b) First Derivative method of digital protection.



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END