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**B.TECH**  
**(SEM VII) THEORY EXAMINATION 2021-22**  
**POWER SYSTEM PROTECTION**

**Time: 3 Hours****Total Marks: 70****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

1. **Attempt all questions in brief.** **2 x 7 = 14**
- Explain the operating principle of distance relay.
  - “A Relay is said to be the brain of protective system.” Explain the meaning of this statement.
  - Draw a ‘Trip circuit’ including CT, PT, Relay, Battery and Circuit Breaker. Explain its operation.
  - Explain principle of operation of induction cup relay.
  - What do you understand by the term “Current Chopping” ?
  - Explain recovery rate theory of arc interruption in a circuit breaker.
  - Give the classification of circuit breakers based on operating voltage and location.

**SECTION B**

2. **Attempt any three of the following:** **7 x 3 = 21**
- Explain with the help of suitable diagrams the effects of arc resistance and power swing on performance of Plane impedance, Reactance and Mho relays.
  - Give a detailed comparison between static and electromagnetic relay.
  - Write down the operating principles which are used in wire pilot schemes. Discuss the Transley scheme of wire pilot protection.
  - What do you understand by high arc resistance and low arc resistance methods of arc quenching ? Describe the two theories related to arc extinction.
  - What are different types of air blast circuit breakers? Discuss their operating principles.

**SECTION C**

3. **Attempt any one part of the following:** **7 x 1 = 7**
- Explain how gas actuated relay operates. Also write down its applications.
  - Give detailed classification of Electromechanical relays.
4. **Attempt any one part of the following:** **7 x 1 = 7**
- How many types of amplitude comparators are there? Explain their working.
  - Describe how the protection is given to the parallel feeders and ring main system?
5. **Attempt any one part of the following:** **7 x 1 = 7**
- What is a carrier blocking scheme? Discuss its merits and demerits over other types of carrier aided distance protection.
  - What do you understand by the term Auto-Reclosing in circuit breaker? Explain different types of Auto-Reclosing techniques.
6. **Attempt any one part of the following:** **7 x 1 = 7**
- Give a detailed description of indirect testing of a circuit breaker.
  - How are the circuit breakers classified ? Give details of the same.
7. **Attempt any one part of the following:** **7 x 1 = 7**
- Draw and describe complete protection of an Alternator.
  - Draw and describe the operational details of an SF circuit breaker.