

**UNIT IV PART A THEORY OF CIRCUIT INTERRUPTION**

1. What is an arc?
2. Define arc interruption
3. What is meant by restriking voltage.
4. Define recovery voltage.
5. Define current chopping.
6. Mention the different methods of high resistance arc interruption.
7. Define rate of rise of recovery voltage.
8. What is meant by resistance switching
9. What are the advantages of DC circuit breaker.
10. Compare AC & DC circuit breaker.

**1. What is resistance switching?**

It is the method of connecting a resistance in parallel with the contact space (arc). The resistance reduces the restriking voltage frequency and it diverts part of the arc current. It assists the circuit breaker in interrupting the magnetizing current and capacity current.

**2. What do you mean by current chopping?**

When interrupting low inductive currents such as magnetizing currents of the transformer, shunt reactor, the rapid deionization of the contact space and blast effect may cause the current to be interrupted before the natural current zero. This phenomenon of interruption of the current before its natural zero is called current chopping.

**3. What are the methods of capacitive switching?**

- Opening of single capacitor bank
- Closing of one capacitor bank against another

**4. What is an arc?**

Arc is a phenomenon occurring when the two contacts of a circuit breaker separate under heavy load or fault or short circuit condition.

**5. Give the two methods of arc interruption?**

High resistance interruption:-the arc resistance is increased by elongating, and splitting the arc so that the arc is fully extinguished \_ Current zero method:-The arc is interrupted at current zero position that occurs 100 times a second in case of 50Hz power system frequency in ac.

**6. What is restriking voltage?**

It is the transient voltage appearing across the breaker contacts at the instant of arc being extinguished.

**7. What is meant by recovery voltage?**

The power frequency rms voltage appearing across the breaker contacts after the arc is extinguished and transient oscillations die out is called recovery voltage.

**8. What is RRRV?**

It is the rate of rise of restriking voltage, expressed in volts per microsecond. It is closely associated with natural frequency of oscillation.

**UNIT IV PART B**

1. Explain the terms restriking voltage, recovery voltage and RRRV.
2. Derive the expression for restriking voltage and RRRV.
3. Explain resistance switching. 4. Explain current chopping
5. Explain interruption of capacitive current
6. Explain the phenomena of arc and arc interruption.
7. Describe DC circuit breaking.
8. What are different arc interruption methods? Explain any one in detail.
9. Draw a schematic of a HVDC circuit breaker and explain its working.
10. a.i. Explain resistance switching for arc extinction in circuit breakers  
ii. Draw the schematic of a HVDC C.B and explain its functioning
14. b.i. Explain the interruption of capacitive current. What are the difficulties faced?  
ii. Explain current chopping in C.B and how it can be minimized.
14. (a) (i) Explain how arc is initiated and sustained when the circuit breaker contacts break. (6)  
(ii) Explain in detail the various methods of arc extinction in a circuit breaker (10) Or  
(b) (i) What is current Chopping? Explain how can the effect of current chopping be minimized? (8)  
(ii) Derive an expression for the Rate of Rise of Restriking Voltage (RRRV) in a C.B.
14. (a) (i) Explain how arc is initiated and sustained when the circuit breaker contacts break. (6)  
(ii) Explain in detail the various methods of arc extinction in a circuit breaker. (10) Or  
(b) (i) What is current Chopping? Explain how can the effect of current chopping be minimized? (8)  
(ii) Derive an expression for the Rate of Rise of Restriking Voltage (RRRV) in a C.B. (8)
14. (a) (i) Explain the methods of arc interruption. (10)  
(ii) Write a brief note on HVDC circuit breakers and state their Application.
- (b) (i) Discuss the phenomenon of current chopping. (8)  
(ii) Write short note on resistance switching. (8)
- 15.. (a) What is resistance switching?  
(b) Derive the expression for critical resistance. (12)
2. (a) Explain the phenomenon of current chopping in a circuit breaker. (12)  
(b) What measures are taken to reduce it? (4)
3. Discuss the problem associated with the interruption of  
(i) Low inductive current (5)  
(ii) Capacitive current and (5)  
(iii) Fault current if the fault is very near the substation. (6)
4. Explain in detail about RRRV. (16)

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