



- (c) armature core air gap  
(d) all of the above
- f)** The current zero interruption, in oil and air blast circuit breakers, is achieved by **1**  
 (a) lengthening of the gap  
 (b) cooling and blast effect  
 (c) both (a) and (b)  
 (d) deionizing the oil with forced air
- g)** Directional relays are based on flow of **1**  
 (a) power  
 (b) current  
 (c) voltage wave  
 (d) all of the above
- h)** Large internal faults are protected by **1**  
 (a) merz price percentage differential protection  
 (b) mho and ohm relays  
 (c) horn gaps and temperature relays  
 (d) earth fault and positive sequence relays
- i)** The ground wire should not be smaller than No \_\_\_\_\_ copper. **1**  
 (a) 2  
 (b) 4  
 (c) 6  
 (d) 10
- j)** Distance relays are generally **1**  
 (a) split phase relays  
 (b) reactance relays  
 (c) impedance relays  
 (d) none of the above
- k)** The relay with inverse time characteristic will operate within **1**  
 (a) 1.5 sec  
 (b) 5 to 10 sec  
 (c) 5 to 20 sec  
 (d) 20 to 30 sec
- l)** In a single busbar **1**  
 system there will be complete shut down when  
 (a) fault occurs on the bus itself  
 (b) fault occurs on neutral line  
 (c) two or more faults occur simultaneously  
 (d) fault occurs with respect to earthing



- m) Admittance relay is \_\_\_\_\_ relay. 1
- (a) impedance
- (b) directional
- (c) non directional
- (d) none of the above
- n) To protect most of the electrical equipment handling low power, the types of relays used are 1
- (a) thermocouple
- (b) electronic and bimetallic
- (c) both (a) and (b)
- (d) none of the above

**Attempt any four questions from Q-2 to Q-8**

- Q-2                    Attempt all questions                    (14)**
- a) Derive the necessary formula of Rate of Rise of Restriking Voltage. (RRRV) 5
- b) Explain construction, working and advantages of air blast circuit breaker 5
- c) Write the properties of SF6 Gas. 4
- Q-3                    Attempt all questions                    (14)**
- a) Explain the basic trip circuit of relay. Give the classification of relay. 7
- b) Define Plug-setting Multiplier (PSM). Explain Inverse, Very Inverse and Extremely Inverse characteristic of Inverse Relay. 7
- Q-4                    Attempt all questions                    (14)**
- a) Explain the construction and torque equation of induction cup type relay. 4
- b) Explain the Ratio error and Phase angle error of current Transformer. 5
- c) What do you mean by “Arc Interruption”? Explain in brief the two methods of arc interruption 5
- Q-5                    Attempt all questions                    (14)**
- a) An IDMT type over current relay is used to protect a feeder through 500/1 A CT. The relay has a PS of 125% and TMS=0.3. Find the time of operation of the said relay if a fault current of 5000A flows through the feeder. Make use of the data: 7



PSM	2	3	5	8	10	15
Time(sec)	10	6	4.5	3.2	3	2.5

- b) Compare static and Electromagnetic relays 4
- c) What is meaning of Protection circuit & Explain it. 3

**Q-6 Attempt all questions (14)**

- a) Write the Merits and Demerits of CT & PT 4
- b) Why neutral grounding is required? Explain any one method of neutral grounding. 5
- c) Explain the protective schemes use for bus-bar. 5

**Q-7 Attempt all questions (14)**

- a) In a short circuit test on a circuit breaker, the following data was obtained on a frequency transient. 7
- i) Time to reach the peak of restriking voltage  $55\mu\text{sec}$ .
- ii) The peak restriking voltage 100 Kv
- Determine the (a) natural frequency of the circuit, (b) Avg. rate of rise of restriking voltage
- b) Explain minimum oil circuit breaker, with its advantages and disadvantages 7

**Q-8 Attempt all questions (14)**

- a) Explain the Buchholtz relay Protection with help sketch. 4
- b) Explain the different types of faults in generator. 5
- c) Discussed about the transformer protection in power system with help of sketch 5

