

lib.

Protection & Switchgear Engg.

MASTER

Con. 4956-07.

(REVISED COURSE)
(3 Hours)

CD- 7062
[Total Marks : 100

P310/JPO-OLE07-8-12 207

- N. B. : (1) Question No. 1 is compulsory.
 (2) Attempt any four out of remaining six.
 (3) Assume suitable data wherever required.

1. (a) Explain resistance switching. 20
 (b) Static relays and their advantages, disadvantages.
 (c) Explain the properties of SF₆ Gas.
 (d) Explain the meaning of Time-grading and Current - grading used in protection system.

2. (a) Explain the need of biasing of in differential protection. Draw a schematic diagram for differential protection of three phase transformer and explain in brief. 10
 (b) Discuss various parameters of protective relaying. 10

3. (a) Explain following terms :— 10
 (i) Arc extinction in A.C. circuit and D. C. circuit.
 (ii) Making and Breaking capacity of circuit breaker.
 (b) A three - phase alternator has the line voltage of 11 kV. The generator is connected to a circuit breaker. The inductive reactance upto the circuit breaker is 5 OHM per phase. The distributed capacitance upto circuit breaker between phase and neutral is 0.01 micro-farad. Determine the following : 10
 (i) Peak restriking voltage across the circuit breaker
 (ii) Frequency of restriking voltage transient
 (iii) Average rate of restriking voltage upto peak restriking voltage
 (iv) Maximum RRRV.
 Neglect first pole to clear factor.

4. (a) An 11 kV, 100 MVA, generator is grounded through a resistance of 6 OHM. The C.T.S have a ratio of 1000/5. The relay is set to operate when there is an out of balance current of 1 AMP. What percentage of the generator winding will be protected by the percentage differential scheme of protection. 10
 (b) Draw a schematic for motor protection against single phasing and explain in brief. 10

5. (a) (i) Explain resistance switching. 5
 (ii) Explain overreach and underreach in impedance relay and state the measures to overcome it. 5
 (iii) Discuss in brief different ratings of circuit breaker. 5
 (iv) Explain with the help of neat diagram primary and back up protection. What is relay back up and breaker back up. 5

6. (a) Explain the constructional details of HRC fuse. State the advantages of using HRC fuse. How arc is extinguished in HRC fuse. 10
 (b) Explain the construction and working of MOCB. 10

7. Write note on (any two) :— 20
 (a) Different protection used for alternators
 (b) Restricted earth-fault protection for generator
 (c) Amplitude and phase comparators.