Protection & Switchgear Engg.

VT-May.08 55

Con. 2887–08. (REVISED COURSE) CO–3346

(3 Hours) [Total Marks : 100

MASTER

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

B.E. (E) VII Rev Protection & Switchgear Engg.

21/5/08

1. (a) Explain the role of protection in Power System. 10
(b) Explain the following terms :– 10
(i) Arc extinction in A.C. circuit and D.C. circuit.
(ii) Making and breaking capacity of circuit breaker.

2. (a) Describe the construction and principle of operation of an induction type over current relay. Derive torque equation. 10
(b) Discuss various parameters of protective relaying. 10

3. (a) Draw a schematic for motor protection against single phasing and explain in brief. 10
(b) The neutral point of a three phase 20 MVA, 11 KV alternator is earthed through a resistance of 50 ohms, the relay is set to operate when there is an out of balance current of 1·5 A. The CTs have a ratio of 1000/5. What percentage of winding is protected against an earth fault and what should be the minimum value of earthing resistance to protect 90% of the winding ? 10

4. (a) Explain constructional details and arc extinguishing principle in HRC fuse. State advantages of using HRC fuse. 10
(b) A 50 Hz, 11 KV, three phase alternator with earthed neutral has a reactance of 5 ohms per phase, and is connected to busbar through a circuit breaker. The capacitance to earth between the alternator and the circuit breaker is 0·02 μF per phase. Assuming the resistance of the generator to be negligible, calculate. 10
(i) Maximum voltage across the contacts of the circuit breaker.
(ii) Frequency of oscillation
(iii) The average rate of rise of restriking voltage up to the first peak.

5. (a) Explain clearly the difference between impedance relay, reactance relay and MHO relay with the help of their characteristics. 10
(b) Explain the construction and working of vacuum circuit breaker. 10

6. (a) Explain the following :–
(i) Properties of SF_6 gas. 5
(ii) Different ratings of circuit breaker. 5
(b) Discuss the operation of Buchholz's relay with neat diagram. 10

7. Write short notes on :– 20
(a) Minimum oil circuit breaker
(b) Static and electromagnetic relays
(c) Construction and working of SF_6 circuit breaker.