Code: 9A02703

R09

B.Tech IV Year I Semester (R09) Supplementary Examinations, May 2013

SWITCH GEAR AND PROTECTION

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1. (a) Explain the various methods of arc extinction in a circuit breaker.
   (b) In a short circuit test on a 3-pole, 132 KV circuit breaker the following observations are made p.f of fault 0.4 the recovery voltage 0.9 times full line value, the breaking current symmetrical, the frequency of oscillation of restriking voltage 16 KHz. Assume that the neutral is grounded and fault does not involve ground, determine the average rate of rise of restriking voltage.

2. (a) Describe with a neat sketch the working of cross-jet explosion pot in bulk oil circuit breaker.
   (b) Discuss the principle of arc interruption in an
   (i) Oil circuit breaker (ii) Air blast circuit breaker.

3. (a) Explain briefly the role of protection in a power system.
   (b) Draw and explain the principle of operation of an induction type over current relay.

4. (a) What do you understand by amplitude comparator and phase comparator? Prove the duality between them with the help of phasor diagram.
   (b) Show that the polar curve of a beased differential relay using a static comparator is a circle.

5. (a) What are the abnormal conditions in a large alternator against which protection is necessary? Discuss them briefly.
   (b) Describe protection scheme of an alternator against inter-turn fault.

6. (a) Explain with a neat circuit diagram the differential protection scheme used to protect Y-A transformers.
   (b) Describe with a neat sketch the operation of Buchholz relay.

7. (a) Describe in detail the protection of parallel feeder and ring mains.
   (b) Explain carrier current protection scheme.

8. (a) What area the causes of over voltages in power systems? Discuss. Bring out the functions of ground wire in lines.
   (b) Describe the construction principle of operation of value type lighting arrestor.

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