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06EE62

Sixth Semester B.E. Degree Examination, June 2012
Switch Gear and Protection

Time: 3 hrs. Max. Marks:100

Note:1. ***Answer FIVE full questions, selecting at least TWO questions from each part.***
2. ***Assume suitable missing data.***

PART – A

1 a. Explain with a neat sketch, the construction and working of a HRC Fuse. Also explain its properties and characteristics. **(10 Marks)**

b. Derive an expression for short circuit current in R-L series circuit with an alternating current source. Show that the current has D.C. component and A.C component. **(10 Marks)**

2 a. Explain the phenomena which are due to the interruption of capacitive currents. **(10 Marks)**

b. Derive expression for RRRV, maximum RRRV and frequency of oscillation of restriking voltage for circuit breaker. **(10 Marks)**

3 a. With neat sketch, explain the following air blast circuit breakers i) Cross blast type ii) Axial blast type **(10 Marks)**

b. With neat sketch explain the construction and working of non-puffer type of SFG breaker. **(10 Marks)**

4 a. Write explanatory note on:
i) Unit testing ii) Synthetic testing of circuit breakers. **(10 Marks)**

b. Explain the construction, working, advantages and disadvantages of vacuum circuit breakers. **(10 Marks)**

PART – B

5 a. State and explain the characteristics of good protective relaying. **(10 Marks)**

b. Explain with the help of neat sketch the construction and working of non-directional induction type over current relay. **(10 Marks)**

6 a. Explain the working principle and characteristics of impedance relay. **(10 Marks)**

b. With neat circuit diagram and vector diagrams, explain construction and working of negative sequence relay. **(10 Marks)**

7 a. Draw and explain the Merzprice protection scheme for, i) star delta transformer ii) star star power transformer. **(10 Marks)**

b. A 6,600 volt, 3 phase turbo alternator has a maximum continuous rating of 2000 kW at 0.8 p.f. and its reactance is 12.5%. It is equipped with Merzprice circulating current protection which is set to operate at fault currents not less than 200 amperes. Find what value of the neutral earthing resistance leaves 10% of the windings unprotected? **(10 Marks)**

8 a. Draw and explain the ground fault protection of induction motor. **(10 Marks)**

b. A 3 phase 33/6.6 kV star/delta connected transformer is protected by Merzprice system. The C.T's on LT side have a ratio of 300/5. Show that the CT's on H.T side will have a ratio $60 : \frac{5}{\sqrt{3}}$. **(05 Marks)**

c. Mention the various stator faults, rotor faults and abnormal running conditions of generator. **(05 Marks)**

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