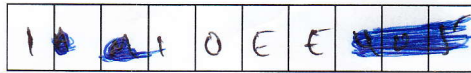




USN



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)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.