ED – 755

VI Semester B.E. (E&E) Degree Examination, December 2014/January 2015
(2K11 Scheme)
EE 604 : SWITCH GEAR AND PROTECTION

Time : 3 Hours Max. Marks : 100

Instruction *: Answer* ***5 (five)*** *full questions choosing atleast* ***2 (two)*** *from* ***each*** *Part.*

PART – A

1. a) Make a list of the main equipments in a sub-station. Draw layout of a substation. **8**
   b) Explain the difference between isolating switch and load switch. **4**
   c) With a neat sketch, explain the time current and cut-off characteristics of HRC fuse. **8**

2. a) Explain in detail the two theories of arc interruption in ckt breaker. State the assumption made. **8**
   b) Describe the principle of resistance switching. Derive an expression for 'R' critical. **6**
   c) In a short ckt test on a 130 kV, 3ϕ system, the breaker gave the following results : Pf of fault = 0.45, recovery voltage 0.95 times full line voltage, breaker current asymmetrical and restriking transient had a natural frequency of 16 KHz. Determine average RRRV. Assume fault in grounded. **6**

3. a) What are the different ratings of ckt breaker ? **4**
   b) With neat sketch, explain the working of :
      i) Axial blast ckt breaker.
      ii) Cross blast ckt breaker. **10**
   c) What are the function to be performed by the operating mechanism of a ckt breaker ? Briefly explain one type of operating mechanism. **6**

4. a) Discuss the advantages and disadvantages of OCB and ACB. **7**
   b) Explain the properties of SF_6 gas. **5**
   c) With a neat sketch, explain the working of SF_6 switch gear. **8**

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PART – B

5. a) What is a protective relay ? Discuss the requirements of protective relay. **8**

   b) Explain the zones of protection used in protection of large power system. **6**

   c) Derive universal relay-torque equation. **6**

6. a) Explain clearly with neat sketch, the working of directional induction type over current relay. **10**

   b) With a neat ckt diagram and vector diagram, explain construction and working of negative sequence relay. **10**

7. a) Discuss the different transformer faults. What are the protection schemes used for protection of transformers ? **10**

   b) With the help of block diagram, explain static over current relay. **10**

8. Write short notes on **any 4** : **(4×5=20)**

   i) Pilot protection

   ii) Quadrilateral relay

   iii) Distance relays

   iv) Microprocessor based relays.