EJ – 1345

VII Semester B.E. (Electrical and Electronics) Degree Examination, June/July 2015
(2K6)
EE – 703 : 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 generating station, substation and distribution system. **6**

   b) Differentiate between load break switches and earthing switches. **4**

   c) With a neat sketch, explain the construction, operation and chrs of HRC fuse. **10**

2. a) What is Resistance switching ? Derive the expression for critical resistance in terms of system inductance and capacitance which gives no transient oscillation. **8**

   b) Explain any two theories of Arc interruption in ckt breaker. **8**

   c) Explain the principle of Dc-breaking. **4**

3. a) Derive the expression for RRRV, maximum RRV and frequency of oscillation of restriking voltage for ckt breaker. **10**

   b) Brief the phenomenon which are due to interruption of capacitive currents. **4**

   c) In a 132 KV system reactance and capacitance upto the location of the ckt breaker are 5 Ω and 0.02 μF respectively. A resistance of 500 Ω is connected across the ckt breaker. Determine
      i) Natural frequency of oscillation
      ii) Damped frequency of oscillation
      iii) Critical value of resistance. **6**

4. a) Write note on physical, chemical and dielectric properties of SF_6 gas. **5**

   b) Explain the construction and working of vacuum ckt breaker. **8**

   c) With a neat sketch, explain the working of SF_6 switch gear. **7**

PART – B

5. a) What are the essential qualities of protective relaying ? Explain in detail. **8**

   b) Define : (i) Pickup level (ii) burden (iii) dropout w.r.t. to relays. **4**

   c) Explain zones of protection used in protection of large power system. **8**

6. a) With a neat sketch explain the working of induction type directional over current relay. **10**

   b) Explain the working of following differential relays
      i) Current differential relay
      ii) Percentage differential relay. **10**

7. a) With a suitable diagram, explain a negative sequence relay and mention its application. **7**

   b) What are the common types of generator faults ? How is the generator protected against an interturn fault. **6**

   c) Explain a scheme of protection for a ring main feeder. **7**

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

   i) Carrier current protection

   ii) Logic circuit for fault detection and protection

   iii) Static over current relays

   iv) Microprocessor based relays.