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EJ – 762

VII Semester B.E. (E&E) Degree Examination, January 2013
(2K6 Scheme)
EE-703 : SWITCH GEAR AND PROTECTION

Time : 3 Hours Max. Marks : 100

Instruction *: Answer* ***five full*** *questions, selecting at least* ***2 full*** *questions from* ***each*** *Part.*

PART – A

1. a) Draw the single line diagram of a distribution system. **6**

   b) Explain the following :

      i) Earthing switch

      ii) Isolating switch and

      iii) Load break switch. **6**

   c) Explain the construction and working of a HRC fuse with neat diagram and mention its applications. **8**

2. a) Explain the two arc interruption theories in circuit breakers. **6**

   b) Derive an expression for Restriking voltage and mention its significances. **8**

   c) Explain the following with reference to circuit breakers :

      i) Breaking capacity and

      ii) Making capacity. **6**

3. a) A Three phase atternator has the line voltage of 11 KV. The generator is connected to a circuit breaker (CB). The inductive reactance up to the circuit breaker is $6\,\Omega$/phase. The distributed capacitance to neutral is $0.02\ \mu F$. Determine :

      i) Frequency of restriking voltage transcient

      ii) Peak restriking voltage across the C.B.

      iii) Average RRRV up to first peak of the oscillations. **6**

   b) Write a short note on “Arc control devices” in circuit breakers. **6**

   c) Explain the construction and working of self generated pressure oil circuit breaker. **8**

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4. a) Explain the working principle of axial blast air circuit breaker. **6**

   b) Discuss on the properties of SF_6 gas favourable to its use in C.B. as an arc quenching medium. **6**

   c) With a neat diagram of Vacuum Interrupter explain its construction and working. **8**

PART – B

5. a) Explain the four basic requirements of protective relays. **8**

   b) Define the following terms used in protective relaying :

      i) Pickup level

      ii) Reset level

      iii) Over reach

      iv) Under reach. **4**

   c) Explain the principle working of induction relays with relevant diagrams. **8**

6. a) Explain the construction and working of directional overcurrent relay. Mention the different connections used for the directional property. **10**

   b) Explain the working principle of impedance and reactance distance relays and indicate their characteristics on RX diagram. **10**

7. a) Explain the differential (percentage differential) protection used for transformer protection with neat connection diagram. **10**

   b) Explain the time graded protection used in feeder protection. **6**

   c) Mention the advantages of solid state relay over the electromechanical type relays. **4**

8. Write short notes on the following :

   a) Level detections in solid state relays **5**

   b) Static IDMT relays **5**

   c) Introduction to microprocessor based relays **5**

   d) Overview of computer based integrated protection system. **5**