UJ – 107

VI Semester B.E. (Electrical and Electronics) Degree Examination, June/July 2017
(2K11 Scheme)
EE 604 : SWITCH GEAR AND PROTECTION

Time : 3 Hours Max. Marks : 100

***Instruction** : Answer **any five full** questions selecting at least **two** questions from **each** Part.*

PART – A

1. a) What are isolating switch, load breaking switch and earthing switch ? **5**
   b) With a neat diagram, explain the construction and working of a HRC fuse. Mention its applications ? **8**
   c) Draw and explain the single line diagram of a 66 kV/11kV substation. **7**

2. a) Explain the recovery rate theory and energy balance theory of arc interruption. **8**
   b) Define Rate of Rise of Restriking Voltage (RRRV) hence derive an expression for RRRV. **6**
   c) Explain "high resistence" method of extinguishing the arc ? **6**

3. a) With a neat sketch, explain the construction and working of vacuum circuit breaker. **10**
   b) For a 132 kV system, the reactance and capacitance upto the location of the circuit breaker is 3 Ω and 0.015 μF respectively. Calculate the following :
      i) Frequency of transient oscillation.
      ii) Max. value of restriking voltage across the contacts of circuit breaker. **6**
   c) Explain the following :
      1) Breaking capacity
      2) Making capacity. **4**

4. a) With a neat sketch, explain the working principle of an axial air blast type circuit breaker. **6**
   b) Mention the advantages and disadvantages of an Oil Circuit Breaker (OCB). **4**
   c) Explain with a neat diagram, the construction and working principle of non-puffer type SF_6 breaker. **10**

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PART – B

5. a) Explain the fundamental requirements of a relay. **6**

   b) Define the following terminologies :

      i) Pick-up level

      ii) Reset level

      iii) Plug Setting Multiplier (PSM)

      iv) Over reach

      v) Under reach. **5**

   c) With a neat sketch, explain the construction and working of directional overcurrnet relay. **9**

6. a) Explain with the help of vector diagram. Working of negative sequence relay. **10**

   b) What are distance relays ? Write the classification of distance relays. **6**

   c) What is universal relay torque equation ? Mention its use. **4**

7. a) With a neat circuit diagram, explain the Merz-price protection scheme for star-delta transformers. **10**

   b) Write short notes on : Protection of radial feeders and parallel feeders. **10**

8. a) Briefly explain the block diagram of a static relay. Mention its advantages and applications. **8**

   b) Explain working of microprocessor based overcurrent relays. **5**

   c) Explain the protection scheme for motors. **7**
