BE – 108

VI Semester B.E. (E&E) Degree Examination, December 2016
(2K11 Scheme)
EE – 604 : SWITCH GEAR AND PROTECTION

Time : 3 Hours Max. Marks : 100

Instruction : *Answer **any five full** questions choosing atleast **two** from **each** Part.*

PART – A

1. a) Explain with a neat sketch, the construction and working of a HRC fuse. Also explain its properties and characteristics. **8**

   b) Explain the difference between isolating switch and load break switch. **4**

   c) Explain with a neat diagram any two types of bus-bar arrangements used in substations. **8**

2. a) Describe the principle of resistance switching and derive the value of the critical resistance where L and C are inductance per phase of the system respectively upto the circuit breaker location point. **8**

   b) Mention the ratings specified for a circuit breaker. **4**

   c) For a 132 KV system, the reactance and capacitance upto the location of the C.B. is 3 Ω and 0.015 μF respectively. Calculate

      i) The frequency of transient oscillation

      ii) Maximum value of restriking voltage across the contacts of the C.B. and

      iii) Maximum value of rate of rise of restriking voltage. **8**

3. a) With a neat diagram explain the construction and working of vacuum circuit breaker. **8**

   b) Explain the phenomena of current chopping in a circuit breaker. **4**

   c) Mention the different types of short circuit testing stations and write the schematic diagram of a short circuit test plant. What is the function of master C.B. in the test plant ? **8**

4. a) With a neat sketch explain the construction and working of non-Puffer type SF_6 circuit breaker. **8**

   b) Differentiate between indoor and outdoor switch gears. **4**

   c) Explain with a neat sketch the working of a minimum oil circuit breaker. **8**

P.T.O.

PART – B

5. a) State and briefly explain the characteristics of a good protective relaying. **8**

   b) Define :

      i) Pick up level

      ii) Burden

      iii) Drop out with respect to relays

      iv) Under reach. **4**

   c) With a neat sketch explain the working of Induction Type Directional Overcurrent Relay. **8**

6. a) With a neat sketch explain the working of Buchholz Relay. State its advantages and limitations. **8**

   b) What are the advantages of microprocessor based protective relays over electromagnetic and static relays. **4**

   c) Explain the working principle and characteristics of impedance relay. **8**

7. a) Explain the protection of generator against

      i) Loss of excitation and

      ii) Stator inter turn faults. **10**

   b) Discuss the overcurrent protection schemes for (i) Parallel feeders (ii) Ring mains. **10**

8. a) What are the different types of phase comparators ? Explain coincidence type of phase comparator. **8**

   b) With the help of a neat block diagram explain operation of overcurrent static relay. **8**

   c) List the various abnormal operating conditions against which a large induction motor has to be protected. **4**

———————