



B.E./B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2012

ELECTRICAL AND ELECTRONICS ENGINEERING

SEMESTER V – (REGULATIONS 2008)

EE9306 – PROTECTION AND SWITCHGEAR

Time: 3 hrs

Max Marks: 100

Answer ALL Questions

Part A – (10×2=20)

1. Mention the use of reactor in protection of power system.
2. State the functions of current transformer in power system.
3. Draw the operating characteristics of reactance relay
4. What is meant by static relay?
5. Write briefly about bus-bar
6. Mention any two possible faults in alternator
7. Define restriking voltage.
8. State the limitations of fuse?
9. What is the function of oil in minimum oil circuit breaker?
10. What is meant by VCB?

Part B – (5×16=80)

11. (i) Derive an expression for the fault current for single line to ground fault by symmetrical components method. (8)
- (ii) The line currents in a three phase supply to an unbalanced load are represented by $I_R = (6+j12)A$, $I_Y = (8-j1)A$ and $I_B = (-2-j3)A$. The phase sequence is RYB. Calculate the positive, negative and zero sequence currents. (8)
12. a. Explain with the help of neat diagrams, the construction and working of induction type directional power relay and non-directional induction type overcurrent relay. (16)

OR

- b. Explain working principles of impedance relay and mho relay with suitable sketches. Also draw its operating characteristics. (16)
13. a.(i) Describe the Merz-Price circulating current system for protection of alternators (8)
- (ii) How is generator stator winding protected against an inter-turn fault? (8)

OR

b. Discuss different transformer faults. With suitable sketches, describe core-balance leakage protection used in transformers. (16)

14.a. Explain the functions of circuit breaker. Describe various methods of arc extinction in circuit breakers. (16)

OR

b. Write short notes for the following (16)

- (i) prospective voltage
- (ii) Recovery voltage
- (iii) RRRV
- (iv) rupturing capacity

15.a. Discuss with suitable diagram, the construction, principle of operation and applications of SF₆ circuit breakers. (16)

OR

b. Explain the working principle and various types of an air blast circuit breaker with the help of neat diagrams. (16)