

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

V 4573

B.E/B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Fifth Semester

(Regulation 2004)

Electrical and Electronics Engineering

EE 1302 – PROTECTION AND SWITCHGEAR

(Common to BE (Part–Time) Fourth Semester Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out the types of faults in powersystem.
2. What is the need for protection zones in the system?
3. What are the advantages of overcurrent relays over electromagnetic types?
4. Draw the block diagram of a static differential relay.
5. Why current transformers are required in protection schemes?
6. Busbar protection need special attention why?
7. What are the problems encountered in DC circuit breaking?
8. What is meant by arc interruption in circuit breakers?
9. How does a circuit breaker differs from a switch?
10. What is meant by rupturing capacity of a circuit breaker?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss the basic requirements of protection system. (8)
(ii) Explain in detail Power System earthing. What is its significance. (8)

Or

- (b) (i) Explain the theory of symmetrical components for calculating asymmetrical faults. (8)
(ii) Discuss the procedure for computation of fault currents in power system, when a double line to ground fault occurs. (8)
12. (a) Explain the operating principle and the characteristics of an impedance relay. (16)

Or

- (b) (i) Describe the operating principle of an attracted armature type relay? What measures are taken to minimise the noise in it? (10)
(ii) Explain a directional relay in detail. (6)
13. (a) What are the rotor faults in an alternator? For such faults give their causes and suggest protective measures. (16)

Or

- (b) Explain the principle of pilot-wire relaying schemes for protection of transmission lines. List out its merits and demerits. (16)
14. (a) (i) Explain the term restriking voltage. Derive an expression for the same in terms of system voltage, inductance and capacitance across a circuit breaker, when a three phase fault occurs. (8)
(ii) Explain current chopping in circuit breakers and how it can be minimised. (8)

Or

- (b) (i) Explain the interruption of capacitive current. What are the difficulties faced? (8)
(ii) For a 132 kV system, the reactance and capacitance upto the location of the circuit breaker is 3 ohms and 0.015 μ f respectively. Calculate :
(1) the frequency of transient oscillation. (2)
(2) maximum value of restriking voltage. (3)
(3) maximum value of RRRV. (3)

15. (a) Describe the construction and working of SF₆ circuit breaker with multiple breaks. What are its merits and demerits? (16)

Or

(b) Discuss the various methods of testing of circuit breakers. (16)