G 1184 Reg. No...............................

Name.................................

B.TECH. DEGREE EXAMINATION, MAY 2016

Eighth Semester

Branch : Electrical and Electronics Engineering

SWITCH GEAR AND PROTECTION (E)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 marks.

1. Explain the principle of resistance switching. Why is it required in air blast circuit breaker ?

2. Explain the terms :

   (i)   Rated short-circuit breaking current.

   (ii) Rated short-circuit making current of a.c. circuit breakers.

3. How reactance relay characteristic is realized using a sampling comparator ?

4. Define 'differential protection'. Describe the principle of circulating current differential protection.

5. Explain the current balance type differential protection of generator against earth and interphase faults.

6. Explain different internal faults encountered in transformers.

7. Explain the term 'pilot' with reference to power line protection.

8. What is carrier current protection ?

9. What is a ground wire ? What are requirements to be satisfied by ground wires to provide efficient protection to lines against direct lightning stroke ?

10. What is surge impedance ?

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*
Each full question carries 12 marks.

11. Describe the operation of vacuum interrupters and vacuum circuit breakers.

Or

12. Explain current chopping phenomenon associated with ac circuit breaking with waveforms.

Turn over

13. (a) Discuss the role of main and back up protection in the protection of systems.

(7 marks)

(b) Explain the back up protection by time grading principle.

(5 marks)

Or

14. With the help of a neat block diagram, explain the functioning of a static over current relay without time delay. Explain function of each block.

15. (a) Explain the type of protective scheme employed for protection of the filed winding of an alternator against ground fault.

(5 marks)

(b) An 11 kV 100 MVA generator is provided with differential protection scheme. The percentage of the generator winding to be protected against phase to ground fault is 80 %. The relay is set to operate when there is 15 % out of balance current. Determine the value of resistance to be placed in the neutral to ground connection.

(7 marks)

Or

16. Describe the working principle of Buchholz relay. For what type of faults is it employed ?

17. Write short notes on :

(1) The Transley system.

(2) Protection of radial feeders.

(6 + 6 = 12 marks)

Or

18. Explain with the help of neat sketches the set-up of carrier current protection employed in transmission lines.

19. Derive the expressions for voltage and current waves propagated on long transmission lines.

Or

20. Explain how switching surges originate. Discuss the methods to reduce switching overvoltage.

(5 × 12 = 60 marks)