

FACULTY OF ENGINEERING
B.E. 4/4 (E & EE) I Sem. (Main) Examination, December 2011
SWITCH GEAR AND PROTECTION

Time: 3 Hours]

[Max. Marks: 75

Note : Answer all questions from Part A. Answer any five questions from Part B.

PART – A



(25 Marks)

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| 1. What is the need of power system protection ? | 2 |
| 2. Distinguish between primary and back up protection. | 3 |
| 3. What are the advantages of static relays ? | 2 |
| 4. Plot the characteristics of impedance, reactance and MHO relays on R-X diagram. | 3 |
| 5. Explain the principle of circulating current differential protection. | 2 |
| 6. What are the faults that likely to occur in a transformer ? | 2 |
| 7. What is current chopping ? | 3 |
| 8. How arc is initiated in circuit breakers ? | 3 |
| 9. Mention the disadvantages of gas insulated substation. | 3 |
| 10. What is a surge diverter ? | 2 |

PART – B

(50 Marks)

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| 11. a) What is amplitude comparator ? How it can be converted into phase comparator ? | 5 |
| b) Explain the operation of microprocessor based over current relay using block diagram. | 5 |
| 12. a) An over current relay of rating 5A and setting 150% is connected to the secondary of a C.T. of ratio 300/5. Calculate the current in the line for which the relay picks up. | 5 |
| b) Derive the expression for torque developed in induction type relay. | 5 |
| 13. a) Explain the construction and operation of Buchholz relay. | 5 |
| b) Explain the protection of generator against over heating. | 5 |

14. a) What is resistance switching ? 4
- b) What are the advantages and disadvantages of SF₆ circuit breaker ? 6
15. What are ground rods and counterpoise ? Explain clearly how these can be used to improve the grounding condition. Give various arrangements of counterpoise. 10
16. a) Derive expression for maximum RRRV in circuit breakers. 5
- b) Discuss the protective scheme for parallel feeders. 5
17. Write a short note on :
- a) Expulsion type lightning arrester. 5
- b) Peterson Coil. 5