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Question Paper Code : 21410

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Seventh Semester

Electrical and Electronics Engineering

EE 2402/EE 72— PROTECTION AND SWITCHGEAR

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the role of protection relay in a modern power system?
2. What is meant by pick-up current?
3. What are the necessary conditions for two alternating fluxes acting on a common rotor
 - (a) to produce some torque
 - (b) to produce maximum torque.
4. What is meant by differential relay?
5. Discuss the different faults that may occur in an alternator.
6. What is the importance of bus-bar protection?
7. Discuss the arc phenomenon in a circuit breaker.
8. What is meant by recovery voltage?
9. Give the difference between isolator and circuit breaker.
10. State the advantages of SF₆ circuit breaker.

PART B — (5 × 16 = 80 marks)

11. (a) Write short note on the following :
- (i) Various principles of power system protection (6)
 - (ii) Power system earthing (5)
 - (iii) Insulation co-ordination. (5)

Or

- (b) What are the causes of over voltages? Explain the protection against over voltages due to lightning and switching surges. (16)

12. (a) (i) Explain with the help of neat diagram the construction and working of induction type directional power relay. (8)
- (ii) Draw and explain the block diagram of a static relay and state its advantages. (8)

Or

- (b) What is universal torque equation? Using this equation derive the following operating characteristics.

- (i) Impedance relay
- (ii) Reactance relay
- (iii) Mho relay (16)

13. (a) (i) Describe the construction and working of bucholz relay. (10)
- (ii) Discuss the time graded over current protection for parallel feeders. (6)

Or

- (b) (i) Explain with the neat diagram the application of Merz-price circulating current principle for protection of alternator. (12)
- (ii) What is the role of instrument transformer in protective schemes. (4)

14. (a) (i) Explain the methods of arc interruption. (10)
- (ii) Write a brief note on HVDC circuit breakers and state their applications. (6)

Or

- (b) (i) Discuss the phenomenon of current chopping. (8)
- (ii) Write short note on resistance switching. (8)

15. (a) Explain the construction, principle of operation of a minimum oil circuit breaker. What are its main advantages and disadvantages? (16)

Or

- (b) Briefly describe the testing of circuit breakers. (16)
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