

B.E. DEGREE EXAMINATIONS: APRIL / MAY 2010

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U07EE603: Protection and Switchgear

Time: Three Hours

Maximum Marks: 100

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

1. The most probability of occurrence of fault is
 - a. Line-Ground Fault.
 - b. Line-Line Fault
 - c. Line-Line-Ground Fault
 - d. Line-Line-Line Fault
2. Longer the fault persists in a power system, then the system
 - a. Becomes more stable
 - b. Loss stability
 - c. Less damage to the system
 - d. More reliable
3. For a 1A Relay, the plug is set at 0.5A, if the relay current is 5A, then the Plug Setting Multiplier (PSM) is
 - a. 5
 - b. 50
 - c. 10
 - d. 100
4. In which of the following protection, if any fault within equipment would cause the current entering it, to be different, from that leaving it.
 - a. Over current relay protection
 - b. Directional protection
 - c. Differential protection
 - d. Distance protection
5. The relay used to provide protection against incipient fault in a transformer is
 - a. Buchholz relay
 - b. Over current relay
 - c. Directional relay
 - d. Inverse over current relay
6. The time graded and current graded protection is employed in
 - a. Generator protection
 - b. Transformer protection
 - c. Motor protection
 - d. Transmission lines
7. In high resistance method of extinguishing the arc in the circuit breaker, the arc resistance is
 - a. increased with time
 - b. decreased with time
 - c. always constant
 - d. zero
8. The Rate of Rise of Restriking Voltage is define as
 - a. The average value of Restriking voltage / Time taken to reach peak value
 - b. The Peak value of Restriking voltage / Time taken to reach peak value
 - c. The average value of Restriking voltage / The Peak value of Restriking voltage
 - d. The Peak value of Restriking voltage / The average value of Restriking voltage
9. The disadvantages of Oil circuit breaker is
 - a. High deterioration of dielectric strength of oil
 - b. Degree of carbonization is high
 - c. Difficult to remove gas from contact
 - d. All of the above

10. Which of the following is a dielectric test
- a. Making capacity test
 - b. Breaking capacity test
 - c. Operating duty test
 - d. Impulse voltage dry withstand test

PART B (10 x 2 = 20 Marks)

11. What are the different types of faults?
12. Why adjacent zones are made to overlap?
13. What is the difference between plug setting and pick-up value of over current relay?
14. What are the drawbacks of simple differential scheme?
15. What are the internal and external faults affecting transformers?
16. What is the protection schemes employed in Bus bar and transmission lines?
17. What is restriking voltage?
18. What is current chopping?
19. What are the different types of circuit breakers?
20. What are the merits of SF₆ circuit breaker compared with other circuit breakers?

PART C (5 x 14 = 70 Marks)

- 21 a) (i) Describe the various ground and phase faults. (8)
- (ii) Describe the zones of protection. (6)

(OR)

- b) (i) Describe with a neat sketch the basic principle of protective schemes. (8)
- (ii) Describe the essential qualities of protection. (6)

- 22 a) (i) Explain with a neat sketch the operation of a induction type over current relay (8)
- (ii) What are the merits of distance protection compared with other types of protection of feeders? (6)

(OR)

- b) (i) Describe the principle of operation of a distance relay with a neat sketch. (8)
- (ii) Compare a electromagnetic relay with a static relay. (6)

- 23 a) (i) Describe the principle of operation of any one method of protection scheme in Transmission lines. (8)
- (ii) What is the use of CTs and PTs and their applications in protection schemes. (6)

(OR)

b) Describe the Merz price circulating current system for the protection of transformers.

24 a) Explain the 'successive restrikes' and 'current chopping' as applied to interruption of capacitive and inductive currents. How does the resistance switching help in above conduction.

(OR)

b) (i) Explain the how arc is initiated and sustained in a Circuit Breaker when its contacts separated. (6)

(ii) Derive the expression for Restriking voltage. (8)

25 a) Describe the construction, principle of operation and application of a Vacuum Circuit Breaker with a neat sketch

(OR)

b) (i) Explain with neat sketches the principle of operation of an Air blast circuit breaker. (8)

(ii) Describe the different types of testing of circuit breakers. (6)
