KUMARAGURU
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Register Number: ……..

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Seventh Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

EEE119:Protection and Switch Gear

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The rating of a coil of an electromagnetic relay is generally
   a) 1 and 5A b) 5 and 10A
   c) 10 and 25 A d) 50 and 100A
2. The component used in the output circuit of a static relay is
   a) OPAMP b) Comparator
   c) Capacitor d) Thyristor
3. Buccholz relay is most essential for protection against
   a) Interturn fault b) H.T and L.T fault
   c) Earth fault d) Core fault
4. The part of a generator which is prone to damage under heavy unbalanced loading of the generator is the
   a) Stator core b) Stator winding
   c) Rotor core d) Rotor winding
5. The most severe voltage stress occurs across the circuit breakers for
   a) L.L fault c) L.L.G. fault
   c) L.L.L. fault d) L.G fault
6. Current-Choopping phenomenon in a circuit breaker is associated with
   a) Capacitive current b) Small inductive current
   c) Resistance switching d) Short line –faults
7. The circuit breaker preferred in recent times for voltage levels of 132kv to 765kv is

a) Vacuum circuit breaker
b) Minimum oil circuit breaker
c) Air blast circuit breaker
d) Sf6 circuit breaker

8. Which of the following tests is not a routine test?
a) One minute power frequency with stand test
b) Operation test
c) Short time current test
d) Milli -volt -drop test

9. The angle between the phase wires and the ground wire used for lightning protection on the towers is generally
a) 45 degree
b) 60 degree
c) 30 degree
d) 90 degree

10. Most of the times the lightning stroke occurring practically is
a) Direct lightning stroke
b) Induced lightning stroke
c) lightning stroke of type A
d) lightning stroke of type B

PART B (10 x 2 = 20 Marks)

11. What are the various types of electromagnetic relay?
12. What is a differential relay?
13. What are the applications of over current relay?
14. How the alternator is protected from stator faults?
15. Differentiate the current transformers used for protection and measurement.
16. What are the two theories explaining current zero interruption?
17. What is the principle involved in high resistance interruption?
18. What are the important ratings of a circuit breaker?
19. How the circuit breakers are classified?
20. How the transmission lines are protected against direct lightning strokes?

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain the operating principle, constructional features and area of applications of reverse power or directional relay. (10)
(ii) What are the advantages of static relays over electromechanical relays? (4)

(OR)

b) (i) What are the different types of distance relays? (4)
(ii) Explain the operating principle of an impedance relay and characteristics on the

R-X diagram. (10)

22. a) (i) Explain with neat sketch the percentage differential protection of an modern alternator. (7)

(ii) An 11kv 100M.V.A alternator is grounded through a resistance of 5 ohms. The CTS has a ratio 1000/5A.The relay is set to operate when there is an out of balance current of 1A.What percentage of the generator winding will be protected by the percentage differential scheme of protection. (7)

(OR)

b) (i) Explain the differential protection of Delta-Star connected power transformer. (7)

(ii) A three phase 11kv /33kv Star-Delta connected power transformer is protected by differential protection. The CT on the L.V side have a current ratio of 400/5A.What must be the ratio of CTS on the H.V side. How the CTS on both the sides of the transformer are connected. (7)

23. a) (i) What is Restriking voltage? (4)

(ii) Derive an expression for the following (10)

1)Restriking voltage

2)RRRV

Also derive the maximum value of the Resriking voltage and RRRV

(OR)

b) (i) What is resistance switching? Derive the expression for critical resistance in terms of system inductance and capacitance. Which gives no transient oscillation? (7)

(ii) Explain the D.C circuit breaking. (7)

24. a) (i) Explain the construction , operating principle and application of vacuum circuit breaker. (7)

(ii) What are its advantages over conventional type circuit breaker?For what voltage range is it recommended. (7)

(OR)

b) (i) What are the different methods of testing of circuit breaker? (8)

(ii) Discuss their merits and demerits .Which method is more suitable for testing the circuit breaker of large capacity? (6)

25. a) What are the causes of over voltage arising on a power system? Why is it necessary to protect the lines and other equipment of the power system against over voltage?

(OR)

b) Explain the following protective devices used in power system.
1.)ROD GAP 2.)Arcing Horns

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