Register Number……

B.E. DEGREE EXAMINATIONS: NOV/DEC 2012

Seventh Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

EEE119: Protection And Switch Gear

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

Answer All Questions:-

PART A (10 x 1 = 10 Marks)

1. Mho relay is normally used for the protection of

   (a) Long transmission lines (b) Medium length lines

   (c) Short length lines (d) No length criterion

2. If the time of operation of a relay for unity TMS is 10 secs, the time of operation for 0.5 TMS will be

   (a) 20 secs (b) 5 secs (c) 10 secs (d) 5 msecs

3. If two synchronous generators are connected, loss of synchronism will result in

   (a) stalling of generators (b) wild fluctuations in current

   (c) wild fluctuations in current and voltage (d) both (a) and (b)

4. For the stable operation of interconnected system, the passive element that can be used as interconnecting element is

   (a) reactor (b) resistor (c) capacitor (d) resistor and capacitor

5. The rate of rise of restriking voltage depends upon the

   (a) type of circuit breaker (b) inductance of the system only

   (c) capacitance of the system only (d) inductance and capacitance of the system

6. Pilot wire protection is basically used for the protection of

   (a) Transmission line (b) alternators (c) switch-gears (d) transformers

7. Resistance switching is normally resorted in case of

   (a) bulk oil circuit breakers (b) minimum oil circuit breakers

   (c) air blast circuit breakers (d) all types of breakers

8. For rural electrification in a country like India with complex network it is preferable to use

   (a) Air blast C.B (b) oil C.B (c) Vacuum C.B (d) all of the above

9. To avoid arcing connect suitable value of _____ in earthing.

   (a) capacitance (b) inductance (c) resistance (d) susceptance

10. A wire is placed on the top of a transmission line to protect from

    (a) surge high voltage (b) Direct lightning strocks

    (c) indirect lightning strocks (d) Switching over voltages

PART B (10 x 2 = 20 Marks)

11. Differentiate fuse with a prospective relay

12. Define the term pick up current and reset value

13. Why the secondary of a CT should not be open circuited?

14. Why transformer rating in KVA?

15. Define the following terms a) arc voltage b) restriking voltage of circuit breaker

16. What is importance of arc resistance? On which factor does it depend?

17. Suggest a suitable choice of circuit breakers for the following voltage ranges:

    a)3.3 KV to 33KV b) 400KV to 760KV

18. Name the different methods of circuit breaker testing

19. Give at least two merits of a resistance grounded system.

20. What is Peterson coil? What protective functions are performed by this device?

PART C (5 x14 = 70 Marks)

21. a) Explain the following distance relays with R-X diagrams

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

(OR)

b) What is meant by directional feature of a directional over current relay? Describe its Construction, principle of operation and IDMT.

22. a) A star connected, 3 phase 10 MVA, 6.6KV alternator has a per phase reactance of 10%. It is protected by a Merz-Price circulating current protection which is set to operate for fault currents not less than 175 A. Calculate the value of earthing resistance to be provided in order to ensure that only 10% of the alternator winding remains unprotected.

(OR)

b) Describe the importance of bus bar protection. Also explain one scheme of bus bar protection.

23. a) Derive the expression for restriking voltage when breaker has resistance R having value less than infinity. Discuss on restriking voltage when breaker resistance is less than $1/2\sqrt{(L/C)}$.

(OR)

b) Write short notes on following

(i) Current chopping (7)

(ii) Resistance switching. (7)

24. a) Explain the principle of operation of an SF_6 breaker with neat sketches. Also mention the properties of SF_6 gas that makes it more useful for circuit breaking

(OR)

b) Explain with a neat sketch the working of an vacuum circuit breaker. Also mention its advantages and disadvantages.

25. a) Describe various protective measures that are taken against lightning over voltages?

(OR)

b) Explain the operation of various types of surge absorbers

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