22/11/13

R 2008

B.E.(FULL TIME) DEGREE EXAMINATION NOV/DEC 2013

27

Electrical and Electronics Engineering

EE 9306 Protection and Switchgear

V Semester

Time: 3 Hrs Max.Marks:100

Answer All Questions

PART A (10 X 2 = 20)

1. Why are adjacent zones made to overlap?
2. What do you mean by maloperation of a relay?
3. What is the difference between plug setting and pick-up value of an over current relay?
4. Calculate the PSM suitable for a relay setting of 150%, if the fault current is 1500A for the CT ratio is 150/5.
5. Classify the Pilot relaying.
6. What is known as "differential protection"?
7. What is the effect of power factor of current being interrupted on the recovery voltage?
8. An air blast circuit breaker is designed to interrupt a transformer magnetizing current of 10 A (r.m.s.) chops the current at an instantaneous value of 5A. If the values of L and C in the circuit are 35H and 0.03μF, find the value of voltage that appears across the contacts of the breaker. Assume that all the inductive energy is transferred to the capacitor.
9. Why should the making ability of a breaker be more that its breaking ability?
10. Determine the breaking and making current of a circuit breaker rated as 1000A, 2000 MVA, 66 kV for 3 seconds of a three phase oil Circuit Breaker.

PART B(5 X 16 = 80)

11. i. Describe the construction and working principle of Buchholz Relay. Mention its advantages and disadvantages.[10]

    ii. Discuss about the Carrier Current Protection scheme of Transmission Line.[6]

[PTO]

12. a.i. Discuss about the essential qualities of protective system.[8]

ii. Decsribe the functions of various components of a protection system with the help of an schematic diagram.[8]

(OR)

b.i. Discuss about the various methods of earthing and earth resistance measurement techniques.[10]

ii. Decsribe the various methods of protection systems.[6]

13. a.i. Describe the duality between amplitude and phase comparators.[10]

ii. Mention the merits and demerits of static relays.[6]

(OR)

b.i. Discuss about construction and working principle of various types of attracted armature relays with neat sketches.[16]

14.a.i. A 50 Hz , 33kV, 3 phase alternator with earthed neutral has a reactance of 5 ohms per phase and is connected to a bus bar through a circuit breaker. The distributed capacitance upto circuit breaker between phase and neutral is 0.03μF. Determine [10]

i) Peak re stroking voltage across the contacts of the breaker
ii) Frequency of oscillations,
iii) The average rate of rise of re-striking voltage up to the first peak.

ii. Explain the phenomena of current chopping in a circuit breaker.[6]

(OR)

b.i. Derive the expression for restriking voltage and RRRV in terms of system voltage, inductance and Capacitance .[10]

ii. Describe the HVDC circuit breaker construction and working principle. [6]

15. a. Explain the construction and working principle of SF_6 Circuit breaker. Mention its advantages, disadvantages and applications.[10+4+2]

(OR)

b. Describe the construction and working principle of

i. Vacuum Circuit breaker [8]

ii. Minimum Oil Circuit breaker [8]

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