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B.E/ B.Tech (FULL TIME) DEGREE EXAMINATION APRIL/MAY 2014

Electrical and Electronics Engineering

EE 9036 PROTECTION AND SWITCHGEAR

V SEMESTER

Time: 3 Hrs **Answer all Questions** **Max. Marks: 100**

Part –A (10 X 2 = 20)

1) Give % distribution of faults in Various Elements of Power system.
2) What is step potential?
3) What is the difference between plug setting and pick-up value of an over current relay?
4) What are the requirements of protective relaying?
5) What are the causes for the unbalanced conditions in stator currents of an alternator?
6) What is the significance of MHO relay?
7) List out the important components common to most of the circuit breaker?
8) If L and C are 4mH and 0.001micro farad respectively a current chop of magnitude 50A would induce the voltage?
9) Why do we decide the ratings of a circuit breaker on the basis of symmetrical short circuit currents?
10) What is the function of an explosion pot in an oil circuit breaker?

Part –B (5 X 16 = 80)

11) i. Describe the construction details of CT and mention its advantages and disadvantages.[6]

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

12) a)Describe the construction and principle of operation of various types of an induction disc relay.[16]

(OR)

12) b)i) Discuss how an amplitude comparator can be converted into a phase comparator and vice versa.[8]

ii) Explain the operating characteristics of Electromagnetic Reactance Relay .[8]

13) a)i)Explain with neat diagram about the protection of Stator against inter turn faults of an alternator.[8]

ii) Describe the following [8]

i)Protection against Pole slipping
ii) Back up protection
iii)Protection against vibration and distortion of rotor
iv) Protection against motoring

(OR)

13) b)Describe the working principle of percentage differential protection for Transformer. Also explain the construction and working principle of Buchholz Relay.[8+8]

14)a) A 50 Hz 11kV, 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 up to circuit breaker between phase and neutral is 0.02μF. Determine [16]

i)Peak restriking 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.

(OR)

15)b)i) Explain the phenomena of current chopping in a circuit breaker.[8]

ii) Discuss the following phenomenon of CB [8]

i) Resistance switching
ii)Restriking voltage
iii) RRRV

15) a)Explain the constructional details and operation of a SF_6 Circuit breaker. Mention its advantages and disadvantages.[16]

(OR)

15) b)Discuss the principle of operation of a vacuum circuit breaker. List out the advantages and disadvantages.[16]