Question Paper Code : 41012

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Seventh Semester

Electrical and Electronics Engineering

EE6702 – PROTECTION AND SWITCHGEAR

(Regulations 2013)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. Why protection scheme is needed for power system ?

2. Write down the importance of symmetrical components for fault current calculation.

3. Mention the principle of operation of distance relay.

4. Determine plug setting multiplier of a 5 ampere, 3 second over current relay having a current setting of 125% and a time setting multiplier of 0.6 connected to supply circuit through a 400/5 current transformer when the circuit carries a fault current of 4000 A.

5. What is the cause of over speed and how alternators are protected from it ?

6. What are the protection methods used for transmission line ?

7. List out the general characteristics of numerical protection.

8. What are the basic circuits used in static relays ?

9. What are the factors responsible for the increase of arc resistance ?

10. A circuit breaker is rated as 1500 A, 1000 MVA, 3 second, 3 phase oil circuit breaker. Find rated making current.

PART – B   (5×16=80 Marks)

11. a) i) Explain clearly about the zones of protection in power system.   (8)

    ii) Briefly discuss about nature and causes of faults.   (8)

    (OR)

    b) Explain in detail about the need and different methods for neutral grounding
       with suitable diagram.   (16)

12. a) i) With neat sketch explain negative sequence relay.   (8)

    ii) Explain clearly about current balance differential relays.   (8)

    (OR)

    b) Explain impedance relay with suitable R-X diagrams.   (16)

13. a) i) Explain clearly about Buchholz relay for the protection of incipient faults
          in transformers.   (10)

    ii) A star connected, 3 phase, 10 MVA, 6.6 KV alternator has a per phase
        reactance of 10%. It is protected by Merz-price circulating-current principle
        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.   (6)

    (OR)

    b) i) With neat sketch explain the protection schemes for motors.   (8)

    ii) With suitable diagrams explain bus bar protection.   (8)

14. a) Describe the construction, working principle and operation of static over current
       relay.   (16)

    (OR)

    b) i) Compare static relays with electromagnetic relays.   (8)

    ii) Explain the advantages of Numerical relays.   (8)

15. a) i) With neat sketch explain resistance switching.   (8)

    ii) Explain current chopping with suitable diagrams.   (8)

    (OR)

    b) Explain the construction, working principle, operation and application of
       Vacuum circuit breakers.   (16)

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