10EE62

Sixth Semester B.E. Degree Examination, June/July 2018
Switchgear and Protection

Time: 3 hrs.

Max. Marks:100

Note: *Answer any FIVE full questions, selecting at least TWO questions from each part.*

PART – A

1   a.   Define and explain the following terms related to fuse i) Fusing factor   ii) Prospective current   iii) Cut-off current.   **(08 Marks)**
     b.   Explain with a neat sketch the construction and working of H.R.C fuse with tripping device.   **(07 Marks)**
     c.   Write short notes on Isolating switch and load breaking switch.   **(05 Marks)**

2   a.   Explain in detail the theories which explain the arc extension phenomenon.   **(10 Marks)**
     b.   Write a note on interruption of capacitive current.   **(06 Marks)**
     c.   Calculate the RRRV of 132kV circuit breaker with neutral earthed. S.C data as follows; Broken current is symmetrical; restriking voltage has frequency 20KHz, p.f. 0.15. Assume fault is also earthed.   **(04 Marks)**

3   a.   With a neat sketch, explain in brief, the working principle of Axial and cross blast air circuit breakers.   **(10 Marks)**
     b.   With neat sketch explain the working and construction of Non-puffer type SF_6 Breaker.   **(10 Marks)**

4   a.   Write a note on: i) Unit testing   ii) Synthetic testing.   **(10 Marks)**
     b.   Briefly explain the classification of surge Arrester, and explain the principle of operation of a typical surge diverter.   **(10 Marks)**

PART – B

5   a.   Discuss the essential qualities of protective relaying.   **(10 Marks)**
     b.   With neat diagram, explain the working principle of Non-directional induction type over current Relay.   **(10 Marks)**

6   a.   With a neat sketch and vector diagram, explain how a negative phase sequence relay is employed for protection of electrical power system.   **(10 Marks)**
     b.   Explain the construction and working principle of MHO Relay.   **(10 Marks)**

7   a.   With neat diagram, explain the restricted earth fault protection of Generator.   **(07 Marks)**
     b.   Explain the rotor earth fault protection of generators.   **(07 Marks)**
     c.   A 6,600V 3-phase tube alternator has a maximum continuous rating of 2,000kW at 0.8p.f and its reactor is 12.5%. It is equipped with merz price circulating current protection which is not set to operate at fault current not less than 200 Amperes. Find what value of the neutral earthing leaves 10% of the winding unprotected.   **(06 Marks)**

8   a.   With a neat sketch explain the merz price protection for γ – D transformer.   **(08 Marks)**
     b.   With a neat sketch, explain the working of single phase preventer used for induction motor.   **(08 Marks)**
     c.   Write a short note on phase reversal protection in Induction motor.   **(04 Marks)**