Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

EX-603 (GS)

B.E. VI Semester

Examination, December 2017

Grading System (GS)

Switch Gear and Protection

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Draw the connection of sequence networks for
   i) L-G fault
   ii) L-L fault and
   iii) L-L-G fault
   on the terminals of an unloaded alternator, find fault current in terms of equivalent sequence impedances. 7
   b) The line of ground voltages on the high voltage side of a step up transformer are 100kV, 33kV and 38kV on phase a, b and c respectively. The voltage of phase a leads that phase b by 100° and lags that of phase c by 176.5°. Determine analytically the symmetrical components of voltages. 7

2. a) What is meant by directional feature of a directional relay? Describe the construction, principle of operation and application of a directional over current relay. 7
   b) What are the required features of an ideal protective relay? Define terms: 7
   i) Operating time
   ii) Seal in relay
   iii) Burden

3. a) Describe the vacuum circuit breaker in details with neat sketches. 7
   b) Describe the constructional details of SF6 circuit breaker and its operation. Give its advantages and disadvantages. 7

4. a) Explain with neat sketch Merz-Price protection scheme for an alternator. 7
   b) What are the essential qualities of protection in a protective system? Discuss various zones of protection. 7

5. a) Enumerate the basic ideas of insulation coordination. 7
   b) Explain the phenomena of lighting and the protection provided against lighting. 7

6. a) For a 45MVA, 11kV/66kV star delta transformer design the percentage differential scheme. 7
   b) Explain in detail percentage differential protection scheme of transformer. 7

7. a) Discuss the protection of a three-phase alternator in the event of following: 7
   i) Loss of prime mover
   ii) Loss of excitation
   b) Explain: 7
   i) Current limiting reactors
   ii) HRC fuses
   iii) Principle of operation oil circuit breaker
   iv) Arc quenching

8. Write short note on any two of following: 14
   a) Surge absorber
   b) Static relays
   c) Buchholz relay
   d) MHO relay

225