Roll No .....

EX - 603

B.E. VI Semester

Examination, December 2015

Switch gear and Protection

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

1. a) What do you know about symmetrical fault?
   b) What are the possible fault on power system?
   c) State the necessity of current limiting reactor in power system and classify the reactors or basis of their location.
   d) Derive the relationship to determine the fault current for a line to line fault. Draw an equivalent network showing the interconnection of sequence networks to simulate L-L fault.

   OR

   A 50MVA, 11kV three phase synchronous generator was subjected to different types of faults. The fault current are as follows.
   LG fault-4200 A, LL fault - 2600A, LLL fault - 2000A.
   The generator neutral is solidly grounded. Find the per unit values of the three sequence reactances of the generator.

2. a) Give the classification of relays.
   b) State the merits of induction relays.

   c) Explain the following terms (any two)
      i) Selectivity ii) Speed iii) Reliability
   d) Explain with the help of sketch working of a induction cup relay.

   OR

   What is meant by
   i) Time graded
   ii) Current graded
   iii) Time current graded system

3. a) Define the restriking voltage.
   b) Give the application of HRC fuse.
   c) Give the classification of circuit breaker.
   d) Explain the working principle, construction and merits of minimum oil C.B. with the help of neat sketch.

   OR

   Explain the working principle, construction and advantages of SF6 circuit breaker.

4. a) Describe over speed protection of a generator.
   b) What do you know about distance protection?
   c) Explain carrier current protection.
   d) Discuss the abnormalities and faults in alternator with necessary protection.

   OR

   Describe the Merz prize differential protection scheme of a 3 phase transformer with the help of diagram giving the C.T.

5. a) Explain in brief phenomena of lightning.
   b) Write a note on insulation co-ordination.
   c) What are the causes of over voltages arising on a power system.
   d) Explain the principle of working of lightning arrester. State types of lightning arresters.

   OR

   Explain the insulation co-ordination provided to different equipment in substation with the help of neat sketch.

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