Exam.Code:0935
Sub. Code: 6668

2123

B.E. (Electrical and Electronics Engineering)

Fifth Semester

PC-EE-501: Power System - II

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt <u>five</u> questions in all, including Question No. I which is compulsory and selecting two questions from each Part.

x-x-x

1. (a) How unbalanced vectors are represented in symmetrical components?
   (b) Differentiate between transient and subtransient reactance.
   (c) Write advantages of proper coordination of insulation of electrical equipments.
   (d) Draw zero-sequence network for 3-ϕ, Y-connected generator with neutral grounded.
   (e) What are restriking voltage and RRRV of a circuit breaker?

(5 * 2)

PART-A

2. (a) Balanced 3-phase voltages 220 V, line to line are applied to a star connected load consisting of three resistors. The neutral of the load is not grounded. The resistance in phase 'a' is 10Ω, in phase 'b' is 20 Ω and in phase 'c' is 30 Ω. Find the current in phase 'a' by the method of symmetrical components.

   (b) A 3-phase 10.000kVA, 11kV alternator having a reactance of 10% on its own is connected through a 10,000kVA, 11/66kV transformer of 5% reactance on its own base, to a transmission line which has a resistance of 0.15Ω per phase per km. A symmetrical delta connected fault with a fault impedance of 10+j40Ω between lines occurs on the line of 20km from the transformer. If the alternator voltage at no-load is 12.1kV, find alternator current and line currents during fault.

(5,5)

3. Explain Merz-Price protection scheme of relays with necessary diagrams.

(10)

4. (a) An earth fault starting relay has a setting of 20%, current rating 5A. It is connected to a C.T. of ratio 500:5. Calculate pick up current in primary for which the earth fault relay operates.

   (b) Discuss in detail, 3-zone protection scheme provided by distance relays.

(5, 5)

P.T.O.

PART- B

5. (a) What are the requisites of good lightning arrestor? Discuss the relative merits and demerits of (i) rod gaps (ii) expulsion arrestors (iii) valve arrestors.

   (b) How transmission lines are protected against direct strokes of lightening? Discuss in detail.

   (5, 5)

6. (a) For the following data of a 50 Hz generator: emf to neutral 7.5kV (rms), reactance of generator and connected system 4Ω, distributed capacitance to neutral 0.01μF (resistance negligible), find (i) maximum voltage across contacts of circuit breaker when it breaks a short circuit current at zero-current (ii) frequency of transient oscillation (iii) average RRRV of the oscillations

   (b) Illustrate with the help of sketches, the process of arc interruption in multibreak oil circuit breaker with shunt resisters.

   (5, 5)

7. (a) Write advantages of neutral grounding. Explain different types of it.

   (b) Derive formula for ground resistance of hemisphere and driven rod.

   (5, 5)

x-x-x