B.Tech. IN ELECTRICAL ENGINEERING

Term-End Examination

December, 2012

BIEE-022 : POWER SYSTEM

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any five** questions in all. All questions carry **equal** marks. In case of numerical problem assume data wherever not **provided**.*

1. What do you understand by Single Line and reactance diagram of a power system ? Explain the per unit system of analysing power system problems and its advantage. **14**

2. (a) What is a 3-phase unsymmetrical fault ? Discuss the different types of unsymmetrical faults that can occur on a 3 phase system. **8**

    (b) What are current limiting reactors ? Discuss their locational aspects and advantages. **6**

3. Why is load flow study essential for a power system ? Formulate the mathematical model in polar form for a power system using Newton -Raphson method. **14**

4. (a) Derive the Swing equation of a Synchronous machine connected to an infinite bus. **10**

   (b) What are the different factors that affect steady state and transient stability ? **4**

5. (a) Starting from the first principles show that surges behaves as travelling waves. **6**

   (b) Discuss the reflection and refraction of a travelling wave drawing the Bewlay's Lattice diagram with a suitable example. **8**

6. (a) Show that the zero sequence impedance of a 3 phase, star connected local with neutral grounded through an impedence Zw is three times the Zn. **8**

   (b) Draw the zero sequence network for the transformers of the following connection: **6**

   Y/Y ; Y/Δ ; Y/Δ

7. Write short notes on *any two* of the following : **2x7=14**

   (a) Protection of equipment

   (b) Transient in R-L series circuit

   (c) Computer method for short circuit calculations.

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