F 3513

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Reg. No................

Name................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Eighth Semester

Branch : Electrical and Electronics Engineering

POWER SYSTEM ANALYSIS (E)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 marks.

1. What is the importance of impedance diagram ?

2. Explain per unit system.

3. What in unit commitment ? Explain.

4. What is load flow problem ?

5. Write a note on automatic load dispatching.

6. What are system constraints ?

7. Explain different types of faults.

8. What are the factors for the selection of circuit breakers ?

9. Distinguish steady state stability and transient stability.
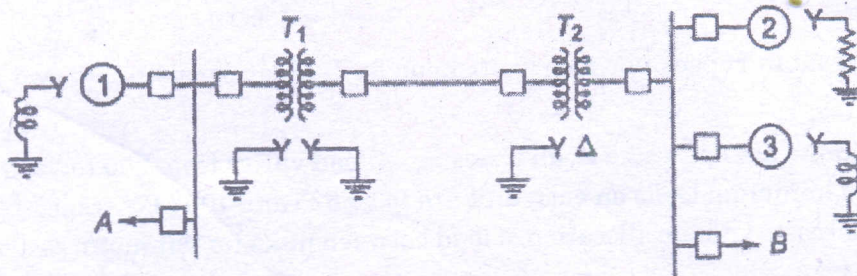
10. Explain the effect of clearing time on stability.
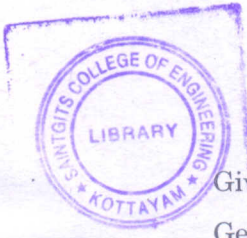
(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 12 marks.

11. (a) Write the reactance diagram for the following system

Turn over

Given Generator No : 1 30 MVA , 10.5 kV , $X'' = 1.6\Omega$

Generator No : 2 15 MVA , 6.6 kV , $X'' = 1.2\Omega$

Generator No : 3 25 MVA , 6.6 kV , $X'' = 0.56\Omega$

Transformer T1 15 MVA , 33/11kV , 3φ X =15. 2Ω per phase on high tension side

Transformer T2 15 MVA , 33/6.2kV 3φ X = 16Ω per phase on high tension side
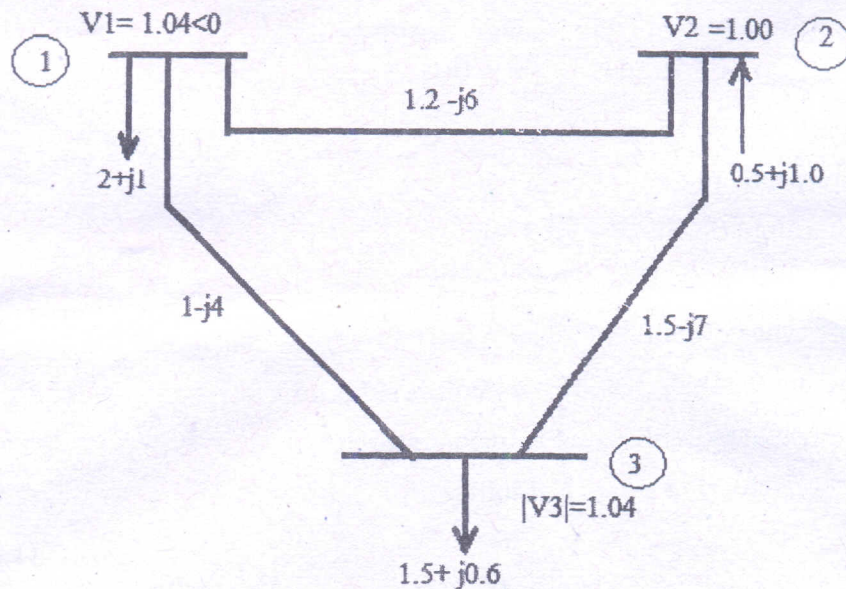
Transmission line 20. 5 Ω phase.

Load A 40 MW , 11 kV , 0.9 lagging p.f.

Load B 40 MW , 6.6 kV, 0.85 lagging p.f.

Or

(b) Determine the voltage cross bus two at the end of 2nd iteration using Gauss-Siedel method.

12. (a) Explain Newton–Raphson method used for finding load flow.

Or

(b) Write short notes on (i) line diagram ; (ii) voltage controlled buses ; (iii) phase shifting transformers.

13. (a) Incremental fuel costs in rupees per megawatt-hour for a plant consisting of two units are given by :

Assume that both units are operating at all times , that load varies from 250 to 1250 MW and that maximum and minimum loads on each unit are to be 625 and 100 MW respectively. Find the incremental fuel costs and the allocation of load between units for minimum cost of various total loads.

Or

(b) (i) Explain the physical interpretation of co-ordination equations ; (ii) Derive Exact transmission loss formulae.

14. (a) Explain symmetrical fault analysis.

Or

(b) Explain the analysis of line to ground, line to line and double line to ground faults in power system.

15. (a) Derive swing equation and write its application in the study of power system protection.

Or

(b) Using equal area criterion, derive an expression for critical clearing angle for a system having a generator feeding a large system through a double circuit line.

(5 × 12 = 60 marks)