M.E. First Semester (Electrical Engg. (Electrical Power System))
Computer Aided Power System Analysis : EP 2102

P. Pages : 2

Time : Three Hours

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Max. Marks : 80

Notes : 1. Answer **three** question from Section A and **three** question from Section B.
2. Assume suitable data wherever necessary.
3. Illustrate your answer necessary with the help of neat sketches.

SECTION - A

1. a) Explain modeling of fixed Tap setting Transformer with equivalent circuit and mathematical expression. 7

   b) Explain modelling of uniform long Transmission line with equivalent ckt and mathematical expression. 7

OR

2. For the single line diagram of power system as shown in figure 2. Determine the following matrices. 14
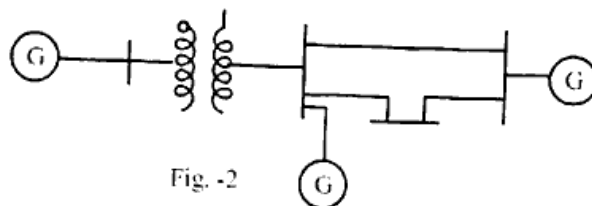

Fig. -2

   i) Element Node Incidence Matrix $\hat{A}$
   ii) Bus Incidence Matrix A
   iii) Branch path incidence Matrix K.
   iv) Basic cut set incidence matrix B
   v) Augmented cut set incidence matrix $\hat{B}$.
   vi) Basic loop incidence matrix and
   vii) Augmented loop incidence matrix.

3. Explain with the help of flow chart. Newton Raphson load flow method using YBus in polar coordinates. 13

OR

4. For the line to ground fault at bus 'P', derive the equations for total fault current and fault voltage at p^{th} bus and effect of this fault on other buses in terms of symmetrical components and phase quantities. 13

5. a) What is sparse matrix? compare the method of triangularization and bi-factorization. 7

   b) Define and illustrate positive. negative and zero sequence impedance Networks of power system components. 6

OR

6. What are the various types of symmetrical and unsymmetrical faults occurring on power system? What is the need of symmetrical components? 13
   Draw and explain graphical representation of positive, negative and zero sequence component of balanced system.

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SECTION - B

7.   Explain linear model of power system for slate estimation and derive equations for state   **13**
     estimator.

OR

8.   a)   Explain weighted least square method (whs) algorithms to power system.   **6**

     b)   Discuss briefly various jobs expected from a power system slate estimator.   **7**

9.   Define the term reactive power Name the sources of Reactive power. Discuss any two of   **13**
     these sources in detail.

OR

10. a)   What are the types of SVC?   **7**
          Explain Thyristor Controlled Reactor (TCR).

     b)   Explain principle of operation of Thyristor switched capacitor with V-I characteristics.   **6**

11. What is hydro-thermal scheduling and what do you mean by long term and short term hydro   **14**
     thermal scheduling. How do you justify for cost of water?

OR

12. a)   Explain static response of primary ALFC loop.   **7**

     b)   Explain impacts of parallel computing in power system Applications.   **7**

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