PVP 17

Code: **17EEPC1T1**

I M.Tech - I Semester – Supplementary Examinations December 2018

ADVANCED COMPUTATIONAL METHODS IN POWER SYSTEMS
(POWER SYSTEM & CONTROL)

Duration: 3 hours Max. Marks: 60

Answer the following questions.

1. a) Explain the terms with example
   i) Tree ii) Basic cut sets 7 M

   b) The oriented connected graph of a system is shown in Figure-1. Obtain:

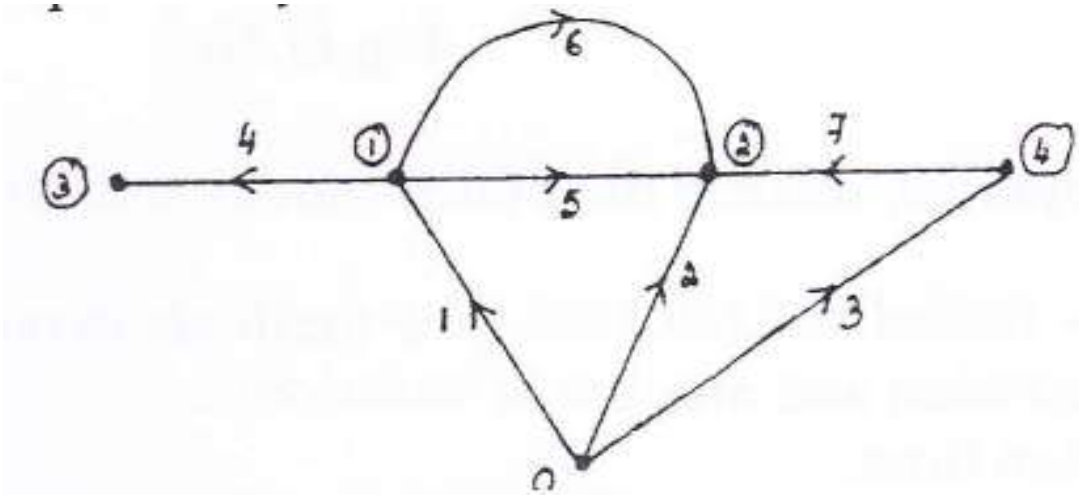


Figure-1

i) Basic cutset incidence matrix B
ii) Basic loop incidence matrix C.
Select elements 5, 6 and 7 as links. 8 M

OR

2. a) Define the terms with examples: i) Path ii) Link 6 M

b) For the sample power system shown in Figure-2 obtain: $\hat{A},\ A, K, B, \hat{B}, C, and\ \hat{C}$. Assume elements 4 and 5 as links, choose Bus 1 as reference. 9 M

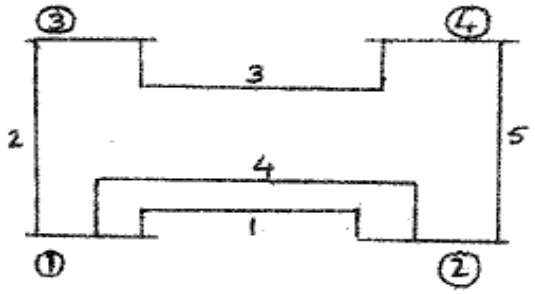
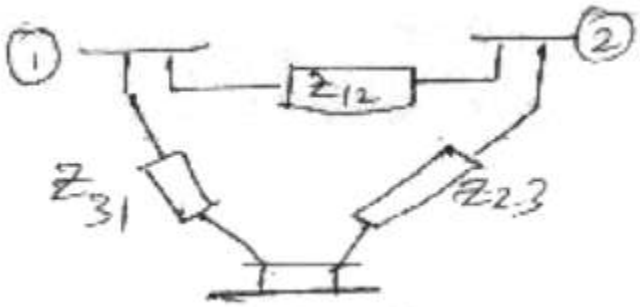


Figure-2

3. a) For the system shown below find Y_{Bus} using nodal method. The impedances of the lines are (0.06+j0.2) pu. Neglect shunt admittance. 7 M



b) Discuss the classification of various types of buses in load flow studies. 8 M

OR

4. a) Compare NR and GS method for load flow analysis procedure in respect of the following
   i) Time per iteration ii) total solution time
   iii) acceleration factor iv)number of iterations 7 M

   b) Explain briefly fast decoupled load flow solution method for solving the nonlinear load flow equations. 8 M

5. a) Derive expression for power in terms of symmetrical components. 7 M

   b) A three phase generator with constant terminal voltages gave the following currents when under fault: 1400 A for a line-to-line fault and 2200 A for a line-to-ground fault. If the positive sequence generated voltage to neutral is 2000 volts and the positive sequence reactance is 2 ohms, find the reactance offered to the negative and zero sequence currents. 8 M

OR

6. a) Describe the generalized fault analysis using Z_{BUS} for three phase balanced fault. 7 M

   b) Explain the fault analysis for determination of open conductor condition. 8 M

7. Describe the formulation of Z_{BUS} using step by step method. 15 M

OR

8. a) Describe the single line contingency analysis. 7 M

b) Explain the contingency analysis for DC power flow model. 8 M