### Review questions

1. What is a sparse matrix?
2. Why don’t we normally take the inverse of matrices directly?
3. What is Gaussian elimination?
4. What is the LU decomposition?
5. Once we do the LU decomposition, how do we solve Ax=b?
6. What does order N-cubed mean?
7. What does CSR format stand for?
8. What does the first vector store?
9. Second vector?
10. Third vector?
11. How do we store a sparse matrix in the linked list format?
12. How do we represent a sparse matrix as a graph?
13. What is node degree in a graph?
14. What are additional non-zeros added during factorization called?
15. How can we reduce fills?
16. What is Tinney 1 ordering?
17. Tinney 2?
18. What is contingency analysis?
19. What is sensitivity analysis?
20. How can we control the flow through a line?
21. What is ATC?
22. What assumptions do linearized sensitivities make?
23. What is the B-tilde matrix?
24. What is the A matrix?
25. What is the B-prime matrix?
26. What is the ISF or psi matrix?
27. How do we calculate the PTDF from the ISF matrix?
28. What is an LODF?
29. What is a LCDF?
30. What is the OTDF?
31. What would you conclude if calculating the LODF resulted in a divide by zero error? That is, the LODF is infinite?
32. Can we use distribution factors with reactive power?
33. What does it mean to have an overdetermined system?
34. How is the state estimation problem overdetermined?
35. What method can we use to solve a linear overdetermined problem?
36. What is a norm of a vector?
37. What is the QR factorization?
38. Why do we use the QR factorization?
39. In state estimation, when would you need a pseudomeasurement?
40. Why might there be bad data coming into the state estimator?
41. How can we handle this in the state estimator?
42. What is an EMS?
43. What is SCADA?
44. What is an optimization problem?
45. What types of constraints are there?
46. What does it mean to have a feasible solution?
47. What does it mean if a problem is infeasible?
48. What is a mixed-integer linear program?
49. For economic dispatch, what is the objective and what are the constraints?
50. How does OPF differ from economic dispatch?
51. How does SCOPF differ from OPF?
52. How does unit commitment differ from the others?
53. What is lambda in the economic dispatch?
54. Can the ED account for losses? How?
55. What are two approaches for solving OPF?
56. What are some typical variables in UC?
57. What are some typical constraints in UC?
58. What are some typical parts of the objective function in UC?
59. What is the difference between a vertically integrated utility and a market?
60. How does the LMP function in a market?
61. Why would LMPs vary from location to location?
62. What happens to the LMPs if there is no feasible solution to the OPF?