

IAT_1_PSA_II_2020

* Required

1. Email address *

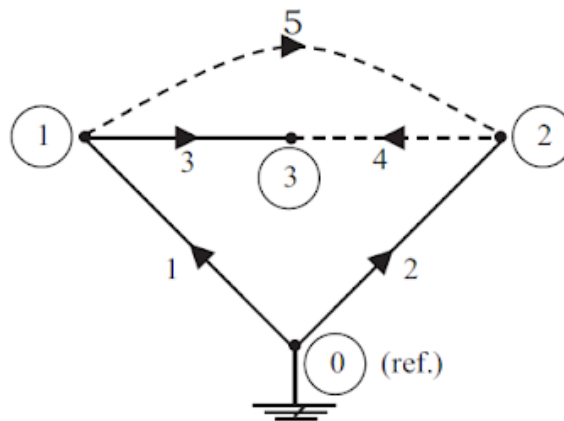
2. Name *

3. USN *

Questions

4. For the given graph, there are 'a' basic cutsets, 'b' basic loops and 'c' no of buses *

3 points

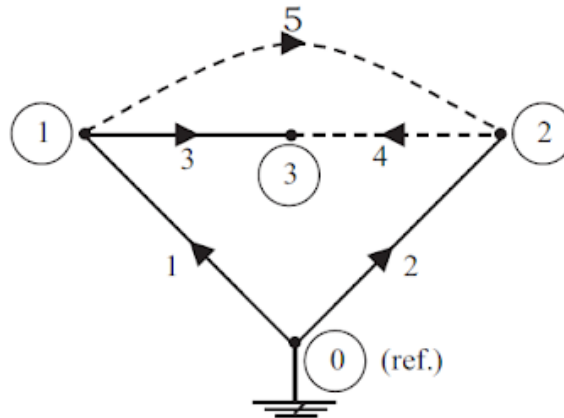


Mark only one oval.

- a=3,b=2,c=3
- a=2,b=3,c=3
- a=3,b=2,c=4
- a=2,b=3,c=4

5. The dimension of bus incidence matrix for the graph given in the diagram will be 1 point

*

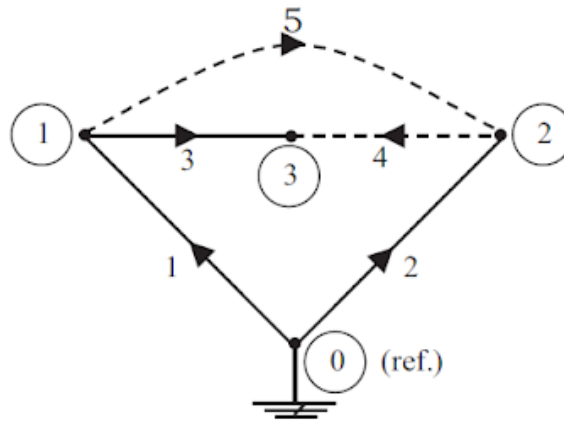


Mark only one oval.

- 5*4
- 5*3
- 5*5
- 3*5

6. The dimension of branch path incidence matrix for the graph below is *

1 point



Mark only one oval.

5*4

5*3

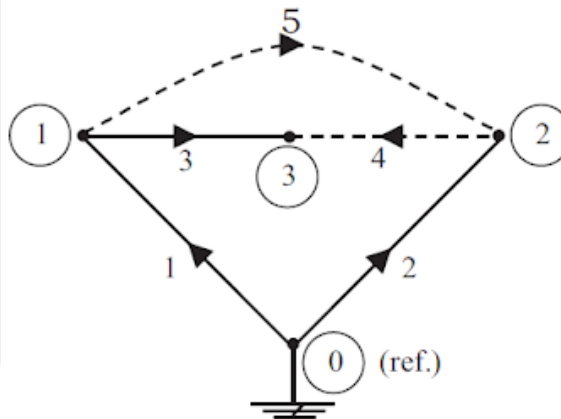
3*3

3*4

7. $T(1,2,3)$ is the tree for the graph given in the diagram. The values of $x_1, x_2, x_3, x_4, x_5, x_6, x_7$ & x_8 in the basic cutset incidence matrix of the graph are

5 points

$$B = \begin{bmatrix} 1 & 0 & x_5 \\ x_1 & 1 & x_6 \\ x_2 & 0 & 1 \\ x_3 & -1 & x_7 \\ x_4 & 1 & x_8 \end{bmatrix}$$



Mark only one oval.

- 0,-1,0,-1 & 0,0,0,1
- 0,0,1,-1 & 0,0,1,0
- 1,0,0,0 & 0,0,0,1
- 0,-1,0,-1 & 0,1,0,1

8. For the power system shown in fig, impedance values are given below. Consider the dotted line is connected to the network. What will be the value of Y_{11} & Y_{12} in the Ybus matrix *

Line (bus to bus):	1 - 2	1 - 3	2 - 3(1)	2 - 3(2)
Impedance in pu:	$0.02 + j0.1$	$0.02 + j0.1$	$0.05 + j0.25$	$0.05 + j0.3$

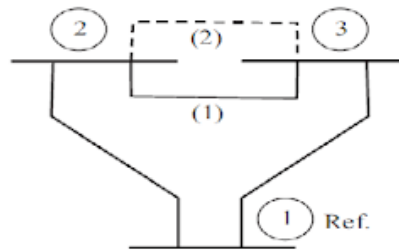


Fig. 2.32: Tree graph.

Mark only one oval.

- $2.6923 - j13.4616, -0.7692 + j 3.8462$
- $3.2328 - j 16.7048, -1.3098 + j 7.0894$
- $0.04 + j0.02, 0.02 + j0.1$
- $0.12 + j 0.65, 0.02 + j 0.1$

9. What is the value of Y_{22} in Y_{bus} of the given power system? *

3 points

Element no.	Positive sequence reactance
1-2	$j1.00$
2-3	$j0.40$
2-4	$j0.20$
3-4	$j0.20$
3-1	$j0.80$
4-5	$j0.08$

Mark only one oval.

$j0.6$

$j1.6$

$-j8.5$

$-j3.5$

10. What is the value of Y_{55} in Y_{bus} of the given power system? *

2 points

Element no.	Positive sequence reactance
1-2	$j1.00$
2-3	$j0.40$
2-4	$j0.20$
3-4	$j0.20$
3-1	$j0.80$
4-5	$j0.08$

Mark only one oval.

$j0.08$

$-j12.5$

$j 0.28$

$-j22.5$

11. What is the value of Y_{31} in Y_{bus} of the given power system? *

2 points

Element no.	Positive sequence reactance
1-2	$j1.00$
2-3	$j0.40$
2-4	$j0.20$
3-4	$j0.20$
3-1	$j0.80$
4-5	$j0.08$

Mark only one oval.

-j 1.25

j0.08

-j 5

j 1.25

12. What is the value of z_{14} in the primitive z matrix of the given power system? * 1 point

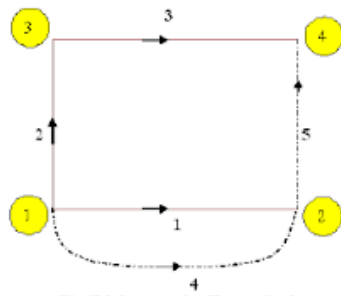


Fig E8 System for Example-8

Table E8: Data for Example-8

Elements	Self impedance	Mutual impedance
1	$j 0.6$	-
2	$j 0.5$	$j 0.1$ (with element 1)
3	$j 0.5$	-
4	$j 0.4$	$j 0.2$ (with element 1)
5	$j 0.2$	-

Mark only one oval.

$j0.4$

$j0.2$

$-j5$

0

13. What is the value of z_{22} in the primitive z matrix of the power system? *

1 point

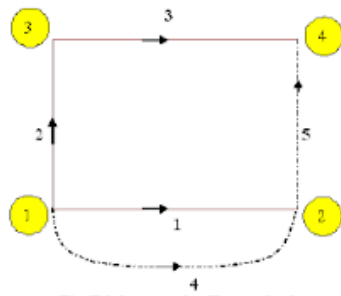


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1	$j 0.6$	-
2	$j 0.5$	$j 0.1$ (with element 1)
3	$j 0.5$	-
4	$j 0.4$	$j 0.2$ (with element 1)
5	$j 0.2$	-

Mark only one oval.

$-j 6.91$

$j 0.5$

$-j2$

$j 0.6$

14. What is the value of z_{23} in the primitive z matrix of the power system? *

1 point

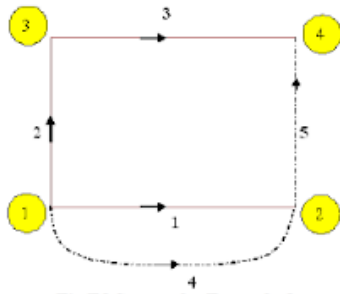


Fig E8 System for Example-8

Table E8: Data for Example-8

Elements	Self impedance	Mutual impedance
1	$j 0.6$	-
2	$j 0.5$	$j 0.1$ (with element 1)
3	$j 0.5$	-
4	$j 0.4$	$j 0.2$ (with element 1)
5	$j 0.2$	-

Mark only one oval.

$j 0.2$

$j 0.5$

0

$j 0.1$

15. Calculate Y_{bus} by singular transformation method for the system given below and value of Y_{22} in Y_{bus} is(consider bus 3 as reference) * 5 points

Element number	Self impedance (Z_{pq-pq})		Mutual impedance, (Z_{pq-rs})	
	Bus-code, (p-q)	Impedance in p.u.	Bus-code, (r-s)	Impedance in p.u.
1	1-2	j 0.452		
2	2-3	j 0.387	1-2	j 0.165
3	1-3	j 0.619	1-2	j 0.234

Mark only one oval.

- j0.387
 -j 2.583
 -j 9.523
 -j 2.935

16. In which of the following buses real and reactive power is not specified? * 1 point

Mark only one oval.

- Swing bus
 Reference bus
 PV bus
 a and b

17. In a load flow problem the variables which are associated with each bus or node are * 2 points

Mark only one oval.

- only magnitude and phase angle of voltage
- magnitude & phase angle of voltage, active power and reactive power
- only active and reactive power
- only magnitude of voltage and active power

18. In case of a slack bus, the specified variables are * 1 point

Mark only one oval.

- magnitude of voltage and its phase angle
- active and reactive power
- magnitude of voltage and reactive power
- active power and voltage magnitude

19. In case of generator bus, the unknown variables are * 1 point

Mark only one oval.

- active power and magnitude of voltage
- reactive power and phase angle of voltage
- magnitude of voltage and its phase angle
- none of these

20. The meeting of various components in a power system is called * 1 point

Mark only one oval.

- branch
 link
 bus
 graph

21. Usually the bus having the largest generating station connected to it is selected as slack bus * 1 point

Mark only one oval.

- True
 False

22. The dimension of basic loop incidence matrix is * 2 points

Mark only one oval.

- elements by branches
 elements by links
 elements by nodes
 branches by bus

23. If a graph has 6 nodes and 8 elements ,the number of links will be * 2 points

Mark only one oval.

- 5
- 3
- 6
- 8

24.shows the geometrical interconnection of the elements of a network * 1 point

Mark only one oval.

- graph
- tree
- basic cutsets
- basic loops

25. A connected sub graph containing all the nodes of a graph with no closed path is called * 1 point

Mark only one oval.

- loop
- tree
- oriented graph
- basic cutsets

26. What is the first iteration value of V2 for the given power system using Gauss seidal method? * 5 points

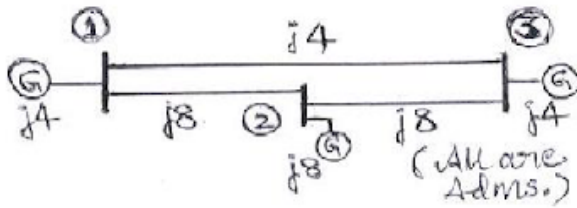
Element No	Bus code	Impedance in pu
1	1-2	$0.08+j0.24$
2	1-3	$0.02+j0.06$
3	2-3	$0.06+j0.18$

Bus no	Bus Voltage in pu	Load in pu		Remarks
		P	Q	
1	$1.05+j0.0$	0	0	Slack
2	-	0.5	0.2	PQ
3	-	0.6	0.25	PQ

Mark only one oval.

- 1.011- j 0.028
- 1.0252 + j 0.5302
- 0.994- j 0.029
- 0.971- j 0.064

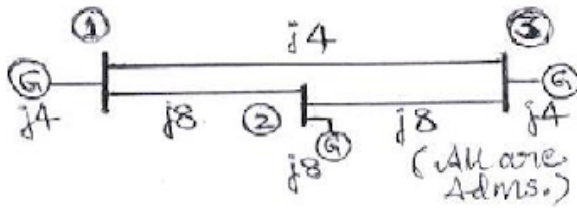
27. For the given power system network, what is the value of Y_{13} of Y_{bus} by direct inspection method? 2 points



Mark only one oval.

- $j4$
- $-j4$
- $0-j 0.25$
- 0

28. For the given power system network, what is the value of Y_{22} of Ybus by direct inspection method? 2 points



Mark only one oval.

- j 24
- j 16
- j 0.0417
- j8

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