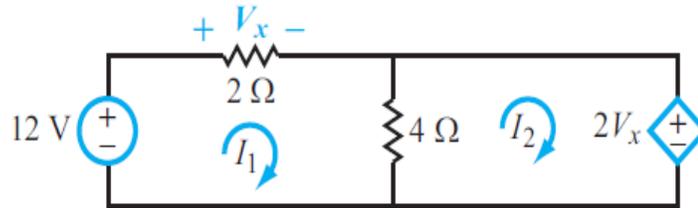


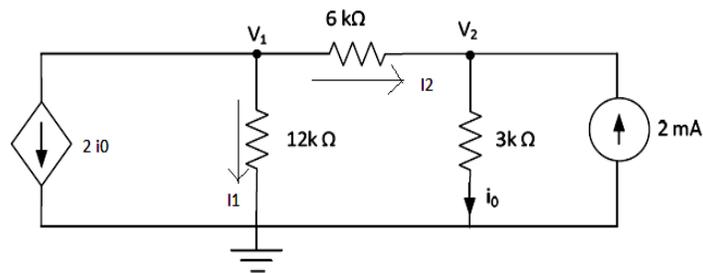
SE\_EXTTC May\_2020 Circuits and Network Theory(CBCGS)

1. Calculate  $v_x$  by mesh Analysis. (2M)



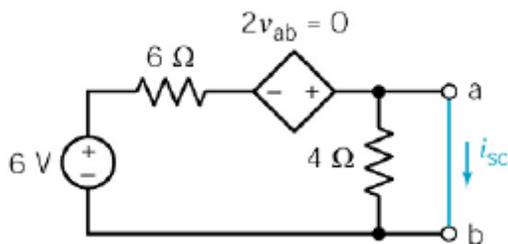
- a) 1.41 v
- b) 2 V
- c) 2.41 V
- d) 0.44 V

2) Find the node voltages for the following(2M)



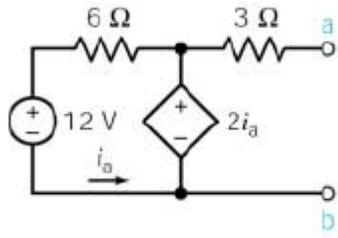
- a)  $-24/5$  V
- b)  $22/5$  V
- c)  $24/5$  V
- d)  $1/5$  V

3) Calculate  $I_{sc}$  for following (2M)

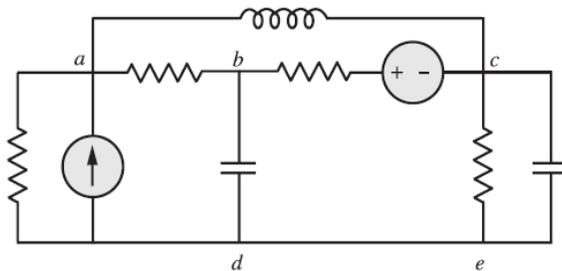


- a) 1 A
- b) 1.8 A
- c) 2 A
- d) 0.1 A

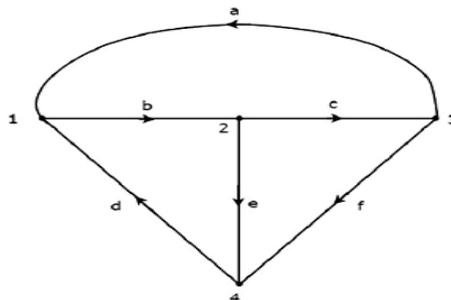
4) Calculate volate between open terminals for following



- 5) If Coefficient of coupling is for mutually coupled coils 5 H and 8H is 0.8 then calculate Mutual inductance.(2M)
- 5.05 H
  - 5.5 H
  - 6.32 H
  - 6.1 H
- 6) In dot convention if current in both the coils are entering into dotted terminals then which statement is true (1M)
- Self and mutual emfs gets added.
  - Self and mutual emfs gets subtracted
  - Self and mutual emfs gets divided
  - Self and mutual emfs gets Multiplied
- 7) Calculate no of possible trees (2M)

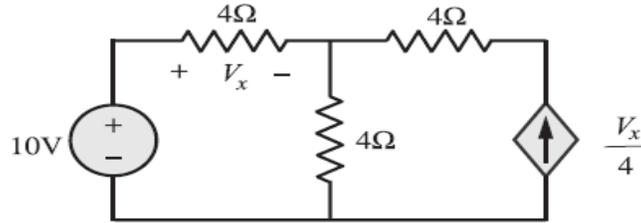


- 21
  - 8
  - 4
  - 28
- 8) In the given directed graph if branches d,e and f are twigs then what is the 2<sup>nd</sup> row of Tieset matrix.(2M)



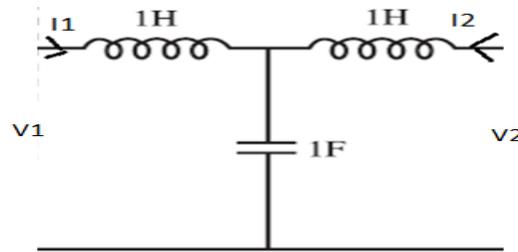
- a) 010110
- b) 100111
- c) 001110
- d) 110011

9) For the network below write f-cutset matrix (2m)



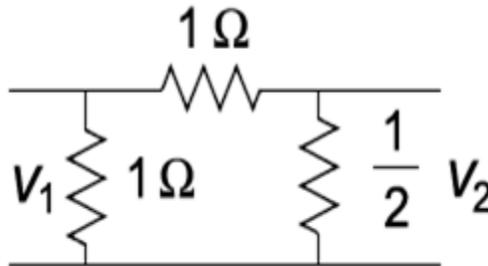
- a) 1-1
- b) 01
- c) 11
- d) 00

10) For the two port network below what is the value of Z21 parameter (2M)



- a) S ohm
- b) 1/s ohm
- c) S<sup>2</sup> ohm
- d) 2s ohm

11) For the two port network below what is the value of y22 parameter (2M)



- a) 4 mho
- b) 3mho
- c) 1.5 mho
- d) 0.4 mho

12) The Z parameters of a two-port network are  $Z_{11} = 10 \Omega$ ;  $Z_{22} = 15 \Omega$ ;  $Z_{12} = Z_{21} = 5 \Omega$ .

Find  $Z_a$ ,  $Z_b$  and  $Z_c$  of T network. (2M)

- a)  $10 \Omega, 10 \Omega, 5 \Omega$
- b)  $5 \Omega, 10 \Omega, 5 \Omega$
- c)  $5 \Omega, 5 \Omega, 5 \Omega$
- d)  $10 \Omega, 10 \Omega, 10 \Omega$

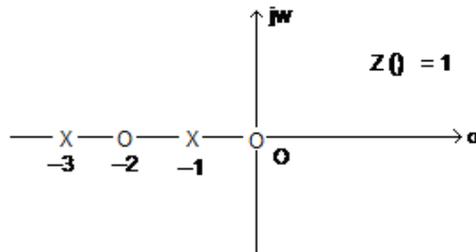
13) The impedance parameters of a two port network are  $Z_{11} = 6 \Omega$ ;  $Z_{22} = 4 \Omega$ ;  $Z_{12} = Z_{21} = 3 \Omega$ . Compute the C parameter. (2M)

- a)  $1/3 \text{ mho}$
- b)  $3 \text{ mho}$
- c)  $2/3 \text{ mho}$
- d)  $3/2 \text{ mho}$

14) Condition for reciprocity for h parameter is (1M)

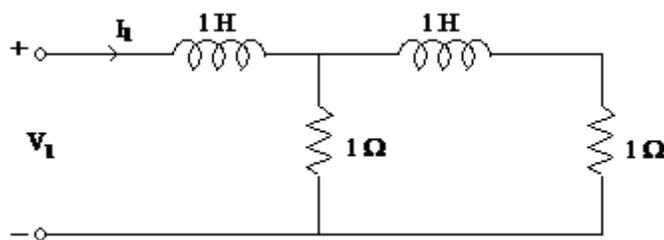
- a)  $h_{11} = h_{22}$
- b)  $h_{12} = h_{21}$
- c)  $h_{12} = -h_{21}$
- d)  $h_{11} - h_{22} = 1$

15) Obtain the impedance function  $Z(s)$  for which pole-zero diagram is shown in Fig.



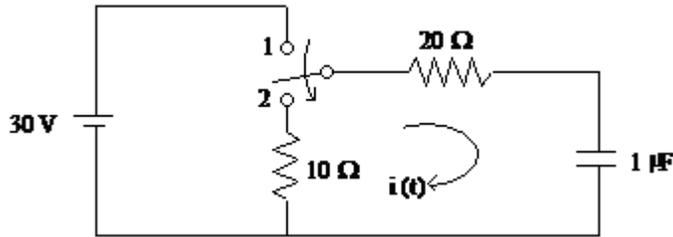
- a)  $S(S+2)/(S+3)(S+1)$
- b)  $S(S-2)/(S+3)(S+1)$
- c)  $S^2(S-2)/(S+3)(S+1)$
- d)  $(S+2)/S(S+3)(S+1)$

16) Calculate driving point impedance functions for following



- a)  $(S^2+3S+2)/(S+2)$
- b)  $(3S+2)/(S+2)$
- c)  $(3S+2)/(S^2+2)$
- d)  $(3S^2+2)/(S+2)$

17) In the network shown in Fig., switch is changed from position 1 to position 2 at  $t = 0$ , steady condition having reached before switching. Find  $i(t)$  at  $t=0+$  (2M)



- a) 1A
- b) -1A
- c) 0.1A
- d) -0.1A

18) For a RL circuit if  $R=100$  ohm and  $L= 0.150$ H then what is Time constant of the circuit.(2M)

- a) 1.5ms
- b) 666.57 s
- c) 15s
- d) 100s

19) Which is not condition for PRF (1M)

- a)  $F(S)$  must be Hurwitz
- b) The poles on  $j\omega$  axis must be simple
- c) Residues calculated must be real and positive
- d)  $F(j\omega) < 0$

20) Identify the function if  $Z(s)= 3 (S+2)/S$  (2M)

- a) RL
- b) RC
- c) Pure R
- d) LC