(1) set 3 soln CBSGS.

Q.P. code:- 21797

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Questions should be —
WRITTEN IN LEGIBLE HANDWRITING IN BLACK INK.
SIGNS, SKETCHES OR FIGURES IF ANY BE DRAWN IN NEAT BLACK INK,
so as to avoid mistakes in the printed question papers.

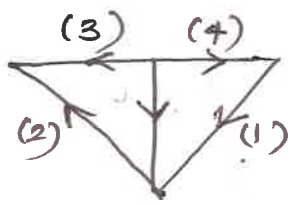
ENAS.

Duration ..... Hours. Total Marks assigned to the paper .....

SOLUTION.

Q. No. | Marks

Q.1 a) **N.B. :**



$[AA^T] = 8$

b) -ve quotient ∴ not Hurwitz.

c) $I_{10\Omega} = 1.05A$, $V_8 = 4.7$ Volts.

Q.2 a) $V_A = 6$ Volts, $I_2' = 1.6$, $I_2'' = -0.8$ ∴ $I_2 = 0.8$

b) $V_a = 4.303V$, $V_b = 8.87V$, $V_c = 3.33V$

Q.3 a) (i)

	1	2	3	4	5	6	7
A	-1	-1	-1	0	0	0	0
B	0	1	1	-1	0	0	0
C	0	0	0	1	-1	0	0
D	0	0	0	0	1	-1	-1
E	1	0	0	0	0	1	1

ii) F-cutset

	1	2	3	4	5	6	7
1	1	0	0	0	1	0	0
2	0	1	1	0	-1	0	0
4	0	0	0	1	-1	0	0
6	0	0	0	0	1	-1	-1

iii) P-theset

	1	2	3	4	5	6	7
3	0	-1	1	0	0	0	0
5	-1	1	0	1	1	1	0
7	0	0	0	0	0	-1	1

P.T.O

Q.3b) $V_{TH} = 18V$, $I_{SC} = 15A$, $R_{TH} = 1.2\Omega$, $I_{4\Omega} = 3.4A$. (02)

Q.4a) $i(0^+) = 1A$, $V_C(0^+) = 0V$, $\frac{di}{dt}(0^+) = 0 A/s$

b) $i_L(0) = i_L(0) = 0$ $i(t) = \frac{V}{R}(1 - e^{-R/L t})$

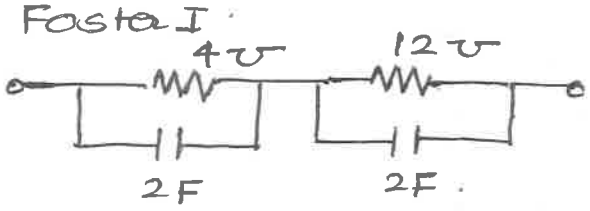
Q.5a) $\frac{V_2}{V_1} = \frac{1}{3s^2+1+3s}$, $\frac{V_2}{I_1} = \frac{1}{s^3+2s}$, $\frac{V_1}{I_1} = \frac{s^4+3s^2+1}{s^3+2s}$.

b) for T- parameters

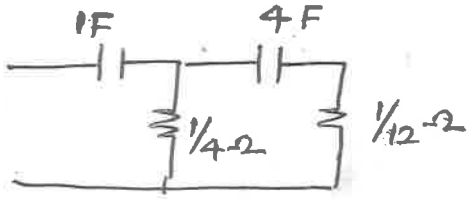
condition of reciprocity - $AD - BC = 1$

symmetry - $A = D$

Q.6 a) Foster I



Cauer I



b) Test whether $F(s) = \frac{s^2+1}{s^3+4s}$ is positive real function.

$F(s) = \frac{N(s)}{D(s)} = \frac{Even}{Odd}$.

$N(s)$ & $D(s)$ is Hurwitz.

1) Simple poles on jw axis.

2) residues are 3/8 real & positive

3) $A(w^2) \geq 0$ for all $w \geq 0$

∴ The function is ~~real~~ positive real.