Scheme of Valuation/Answer Key

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

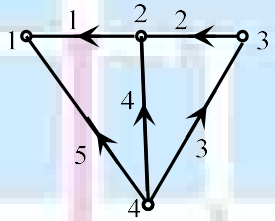
THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: EE201

Course Name: CIRCUITS AND NETWORKS

Max. Marks: 100		Duration: 3 Hours

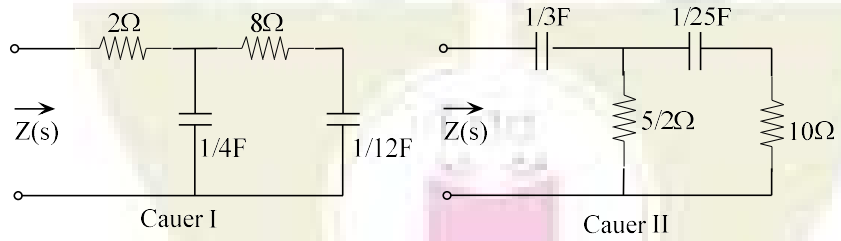
PART A

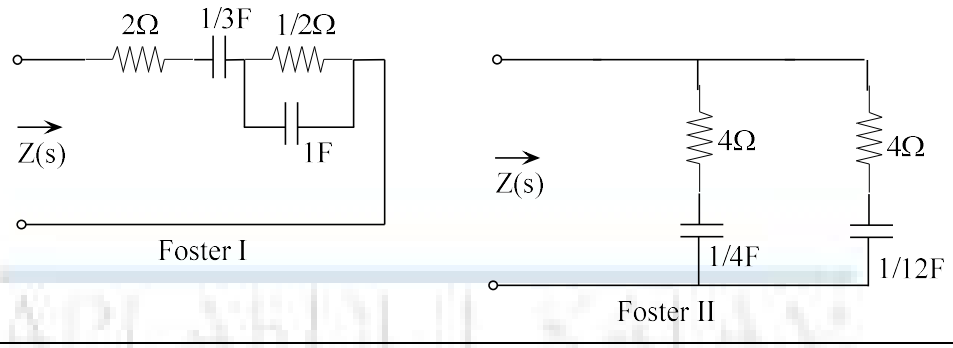
		Answer all questions, each carries5 marks.	Marks
1		$I = \frac{23}{12} = 1.9A$ (by any method) ….. 5 marks	(5)
2		Directed Graph …. 5 marks 	(5)
3		$v_c = V(1-e^{-t/RC})$ $50 = 100(1-e^{-5/RC})$ $R = 1.44\times10^6\,\Omega$ ….. 5 marks	(5)
4		$(Ls+R)I(s) = \frac{50}{s}Li(0)$ $i(t) = 10-8e^{-2000t}$) A ….. 5 marks	(5)
5		$Z_{21}(s) = \frac{1}{2s}$ ….. 2 ½ marks $Y_{11}(s) = \frac{2s}{10s^2+1}$ ….. 2 ½ marks	5
6		Derivation ….. 5 marks	5
7		Differences …. 5 marks	5
8		Not Hurwitz …. 1 mark Continued expansion & proof …. 4 marks (or find roots)	5

PART B

Answer any twofull questions, each carries10 marks.

9		$I = \frac{50\angle 90°}{3+j4} = 10\angle 53.13°$ ….. 10 marks	(10)
10		Draw oriented graph …. 2 marks Tie set matrix …. 2 marks Branch impedance matrix ….. 1 mark Voltage source matrix ….. 1 mark Current source matrix ….. 1 mark	(10)

		$\begin{bmatrix} 20 \\ -50 \\ 0 \end{bmatrix} = \begin{bmatrix} 14-j4 & -10 & j4 \\ -10 & 20+j5 & -j5 \\ j4 & -j5 & 3+j \end{bmatrix} \begin{bmatrix} I_{l1} \\ I_{l2} \\ I_{l3} \end{bmatrix}$ ….. 3 marks (solution not essential)	
11		$Z_N = 0.01\Omega$ ..... 3 marks $I_N = 9659.3\angle 15° A$ ..... 3 marks $I = 30.52\angle -56.4^o A$ ..... 4 marks	10
		PART C	
		Answer any twofullquestions, each carries10 marks.	
12		$v_c(0) = 200V$ ….. 2 marks $i(t) = -10e^{-25000t} A$ …… 8 marks	(10)
13		$v_c(0) = 1V; i_L(0) = 1A$ …… 3 marks $0.5\frac{di}{dt} + i + \frac{1}{C}\int_{-\infty}^{t} idt = 0$ …… 2 marks $I(s) = \frac{3s}{(s+1)^2+1}$ ….. 3 marks $i(t) = 3e^{-t}(\cos t - \sin t)$ …… 2 marks	(10)
14		$i(0) = 2A$ ….. 2 marks $0.01\frac{di}{dt} + 25i = 100$ ….. 4 marks $i(t) = 4 - 2e^{-2500t} A$ …… 4 marks	
		PART D	
		Answer any twofull questions, each carries 10 marks.	
15		$Y = \begin{bmatrix} 1.5 & -0.5 \\ -0.5 & 1.5 \end{bmatrix}$ ..... 5 marks $Z = \begin{bmatrix} 0.75 & 0.25 \\ 0.25 & 0.75 \end{bmatrix}$ ..... 5 marks	(10)
16		 Cauer I ..... 5 marks Cauer II ..... 5 marks	(10)
17		$Z(s) = 2 + \frac{4s+6}{s(s+2)} = 2 + \frac{3}{s} + \frac{1}{s+2}$ ….. 2 marks Foster I form ….. 3 marks $\frac{Y(s)}{s} = \frac{1/4}{s+1} + \frac{1/4}{s+3}$ ….. 2 marks Foster II form ….. 3 marks	10


2Ω
1/3F
1/2Ω
Z(s)
1F
Foster I
Z(s)
4Ω
4Ω
1/4F
1/12F
Foster II

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