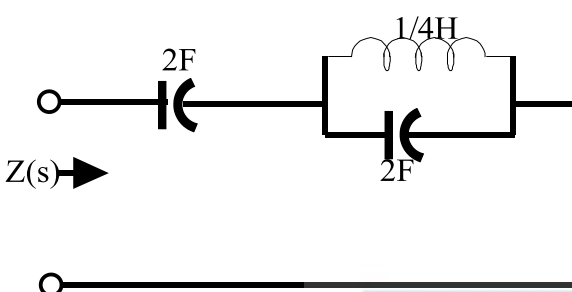
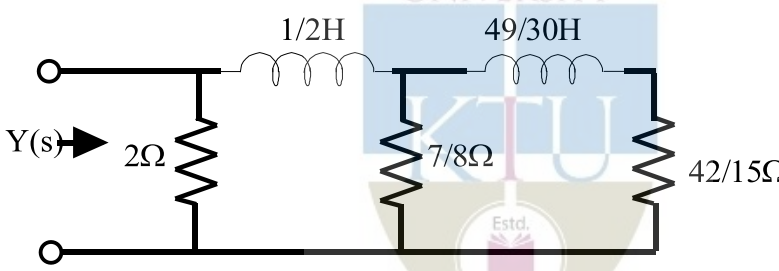
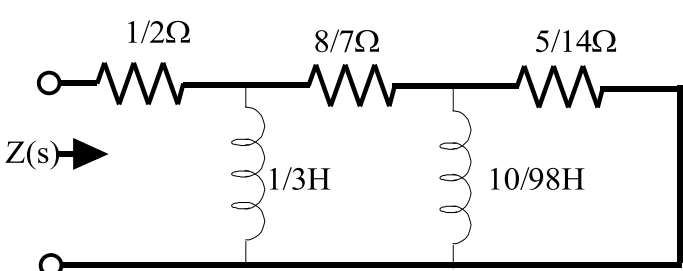


<b>Scheme of Valuation/Answer Key</b>		
(Scheme of evaluation (marks in brackets) and answers of problems/key)		
<b>APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY</b>		
THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018		
<b>Course Code: EE201</b>		
<b>Course Name: CIRCUITS AND NETWORKS</b>		
Max. Marks: 100		Duration: 3 Hours
<b>PART A</b>		
<i>Answer all questions, each carries 5 marks.</i>		Marks
1	Statement – 2marks    Proof – 3marks Power is maximum when $Z_L = Z_S^*$	
2	Oriented graph – 1mark Incidence Matrix – 2marks    Tie set Matrix – 2 marks	
3	Differential Equation- 2 marks; Solution- 3 marks ( Can be done in any method) $1 = 4i(t) + 1 \frac{di(t)}{dt} + 1/0.25 \int i(t) dt$ $I(s) = \frac{1}{s^2 + 4s + 4}$ $i(t) = te^{-2t}$	
4	$V(s) = RI(s) = I(s)$ ;    - 1 marks $\therefore v(t) = L^{-1}I(s) = L^{-1} \frac{s+2}{s^2 + 2s + 2} = e^{-t}(\cos t + \sin t)$ - 4 marks	
5	5 conditions – 5 marks	
6	Explanation of h parameter with equation – 3marks. Equivalent Circuit – 2marks	
7	Take the derivative and do continued fraction expansion – 5marks Polynomial is Hurwitz (Can be done in any method)	
8	(i) RC Impedance Function( Pole near the origin) – 2.5marks (ii) RL Impedance Function(zero near the origin)– 2.5marks	
<b>PART B</b>		
<i>Answer any two full questions, each carries 10 marks.</i>		
9	Determining Norton equivalent current – 4marks    Equivalent Resistance – 4marks. Drawing the Norton equivalent circuit – 2marks $I_N = -4.6A$ $R_N = 1.43\Omega$	(10)
10	a) Calculation of currents considering individual sources – 4marks Determining the total current – 2marks	(6)

		Current due to 6V source = 0.75A Current due to 1A source = 0.375A Total current = 0.75+0.375 = 1.125A	
	b)	4 properties – 4marks	(4)
11	a)	Drawing oriented graph and selecting a tree- 2 marks Writing Tieset matrix and KVL equilibrium equations – 5marks(2+3) Determining the loop currents – 3marks $I_{L1} = 0.55A$ $I_{L2} = -0.866A$ $I_{L3} = -0.916A$	(10)
<b>PART C</b>			
<i>Answer any twofullquestions, each carries10 marks.</i>			
12	a)	Determine initial voltage across the capacitor – 2marks Differential equation in position 2- 3 marks Determine capacitor voltage ( Any method) – 5marks $v_c(t) = -50 + 150 e^{-200t}$	(10)
13	a)	Determine initial current through the inductor – 3marks $I_L(0^-) = 2A$ Writing the mesh equations- 3 marks Determine $i(t)$ ( Can be any method) –4 marks $i(t) = 2 e^{-90t}A$	(10)
14	a)	Writing the mesh equations correctly – 6 marks; 3 marks each. Assuming clockwise directions for the two mesh currents, <b>Mesh 1:</b> $(4 + j5)I_1 - (4 + j2.5)I_2 = 10$ <b>Mesh 2:</b> $-(4 + j2.5)I_1 + (14 + j10)I_2 = 0$ Solving for current through 10Ω( Any method) - 4marks $i = 0.7619 + 0.476j$	(10)
<b>PART D</b>			
<i>Answer any twofullquestions, each carries 10 marks.</i>			
15	a)	Condition for reciprocity – 2.5 marks    Symmetry – 2.5 marks	(5)
	b)	Determine A and C – 2.5marks    B and D – 2.5marks $A = 6/5$ $B = 17/5$ $C = 1/5$ $D = 7/5$	(5)

16	a)	Drawing two port networks parallel – 1 mark Determining overall admittance parameter – 4marks	(5)
	b)	Synthesise in Foster I form – 5marks 	(5)
17	a)	Cauer I Form – 5marks  Cauer II Form – 5marks 	(10)
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**QUESTION PAPER PATTERN (End semester exam)**

**Part A:** 8 questions.

One question from each module of Module I - IV; and two each from Module V & VI.  
Student has to answer all questions.  $(8 \times 5) = 40$

**Part B:** 3 questions uniformly covering modules I&II

Student has to answer any 2 questions:  $(2 \times 10) = 20$

**Part C:** 3 questions uniformly covering modules III&IV

Student has to answer any 2 questions:  $(2 \times 10) = 20$

**Part D:** 3 questions uniformly covering modules V&VI

Student has to answer any 2 questions:  $(2 \times 10) = 20$

**Note:** Each question can have maximum of 4 sub questions, if needed.