FIRST INTERNAL ASSESSMENT

Sem: III | Sub: Network Analysis | Sub. Code: 15EC34
Date: 15/09/17 | Time: 3:00pm-4:00pm | Max. Marks: 25

Note: Answer two full questions, draw sketches wherever necessary.

Q. No		Discription of Question	Marks	CO
1	a	Using star-delta transformation find the equivalent resistance between A & B for the network shown below (Fig.1).	6	C204.1
	b	For the network shown below (Fig.2) find the current through resistors 6Ω & 4Ω resistors using mesh analysis?	6	C204.1
		OR		
2	a	For the network shown in (Fig.3) determine voltage 'V' using source shifting & source transformation methods?	6	C204.1
	b	Determine the loop currents i1, i2, i3, i4 in the following network (Fig .4) using mesh analysis?	6	C204.1
3	a	Reduce the Given n/w to a n/w which consists of single voltage source in series with a resistance using source transformation & source shifting methods. (Fig .5)	7	C204.1
	b	Find the Node voltages at node 1,2 & 3 Using node voltage(Fig .6)	6	
		OR		
4	a	For the network shown below (Fig .7) find the node voltages Vd & Vc using nodal analysis.	7	C204.1
	b	Find the Node voltages at V1,V2, & V3 in given n/w (Fig .8) using nodal analysis.	6	C204.1

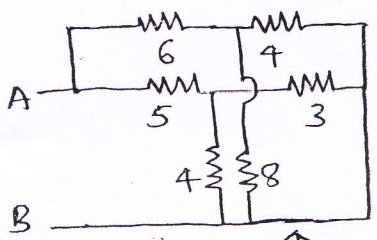

Fig.1

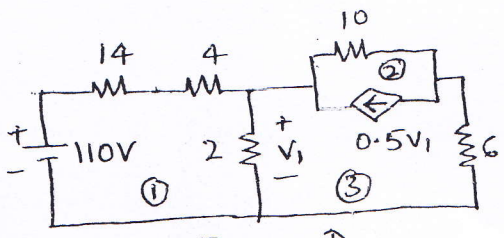

Fig.2

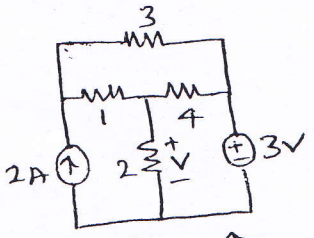

Fig.3

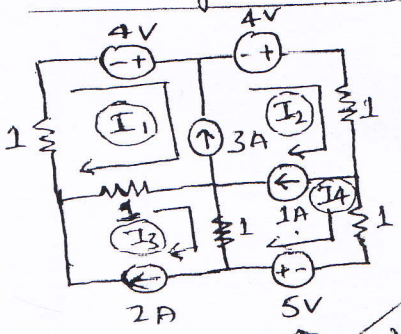

Fig.4

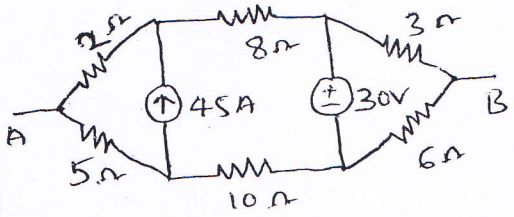

Fig.5

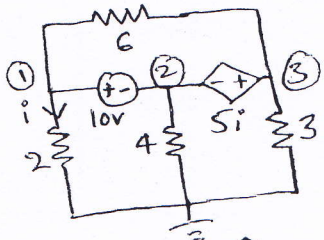

Fig.6

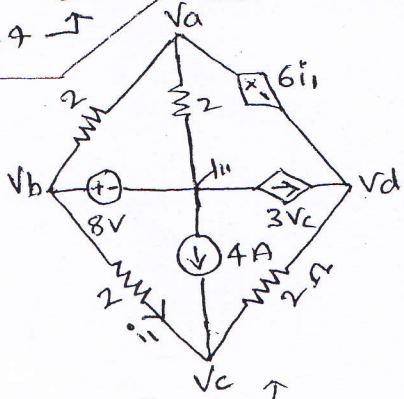

Fig.7

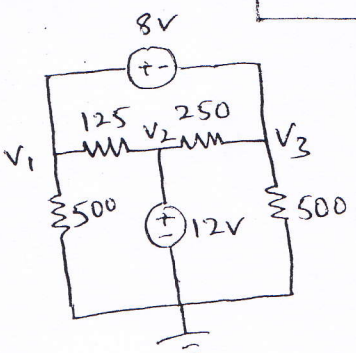

Fig.8

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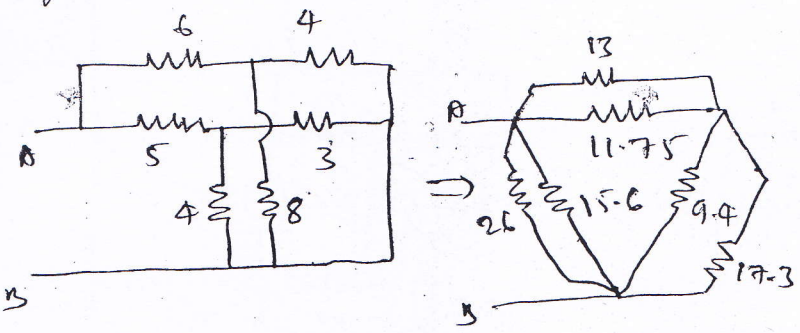
I - IA SCHEME OF EVALUATION

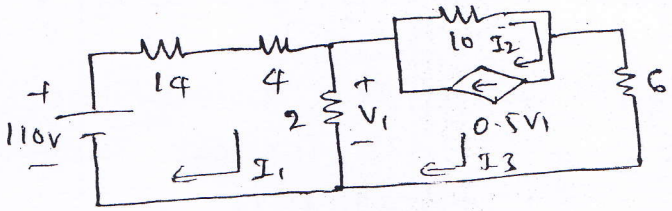
Sem : III	Subject : Network Analysis	Sub Code : 15EC34	Date : 15/09/17

Q. No.	Bit	Description	Marks	Mapped CO's
1	a	Using Star-Delta transformation find the equivalent Resistance bet A & B	6	C204.1



$R_{AB} = 5.43\ \Omega$

1	b)	Find the current through 6Ω & 4Ω Resistor using mesh analysis	6	C204.1



$$20I_1 - 2I_3 = 110 \quad \text{— (1)}$$

$$-2I_1 + 10I_2 + 8I_3 = 0 \quad \text{— (2)}$$

$$I_1 - I_2 = 0 \quad \text{— (3)}$$

$I_1 = 5A$

$I_2 = 5A$

$I_3 = -5A$

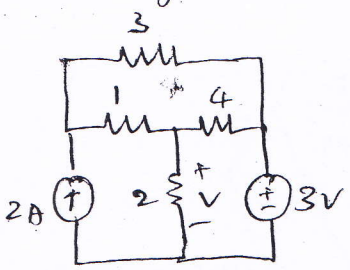
Course Coordinator

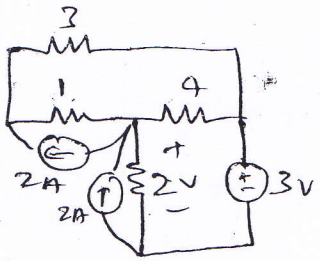
Module Coordinator

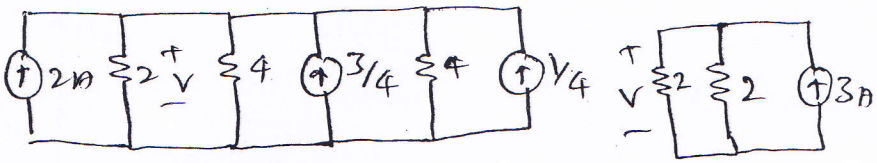
I - IA SCHEME OF EVALUATION

Sem : III | Subject : Network Analysis | Sub Code : 15EC34 | Date : 15/09/17

Q. No.	Bit	Description	Marks	Mapped CO's
2	a	Find the voltage 'V' using source shifting & source transformation	6	C204.1

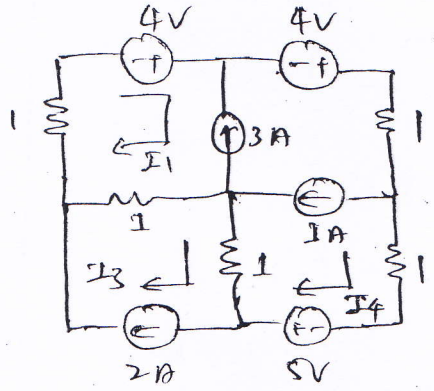






$V = 3V$

2	b	Using mesh analysis Find I_1, I_2, I_3 & I_4 in Given Network	6	C204.1



$2I_1 + I_2 + 2I_4 = 17$

$-I_1 + I_2 + 0I_4 = 3$

$0I_1 + I_2 - I_4 = 1$

$I_1 = 2A$

$I_2 = 5A$

$I_4 = 4A$

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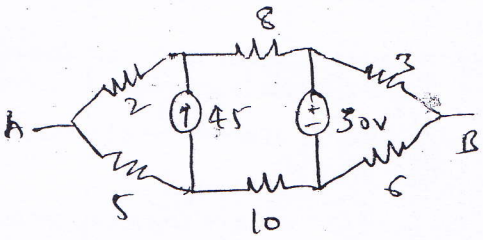
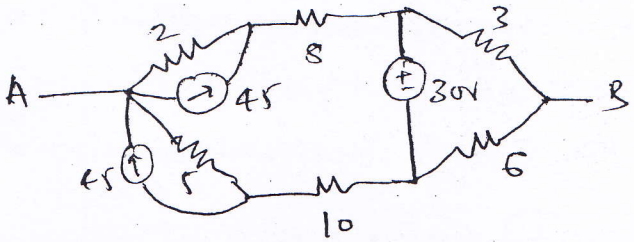
Module Coordinator

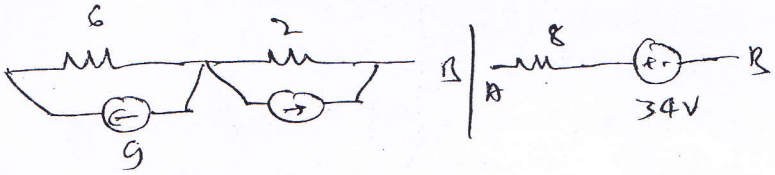
- IA SCHEME OF EVALUATION

Sem: 4th	Subject: Network Analysis	Sub Code: 15EC34	Date: 15/09/17

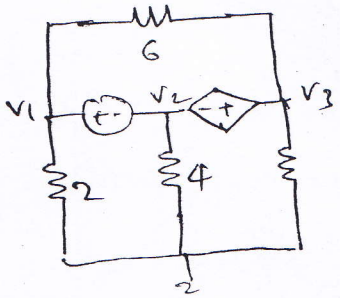
Q. No.	Bit	Description	Marks	Mapped CO's
3	a	Reduce given N/w to N/w which consists of voltage source in series with a resistance	7	C204.1







3	b	Find the Node voltages at 1, 2, & 3 using Nodal analysis	6	C204.1



$0.5V_1 + 0.25V_2 + 0.33V_3 = 0$ — (1)

$V_1 - V_2 = 10$ — (2)

$V_3 - V_2 = 5i$ — (3)

$i = \frac{V_1}{2}$

$2.5V_1 + V_2 - V_3 = 0$ — (4)

$V_1 = 3.04V$

$V_2 = -6.9V$

$V_3 = 0.65V$

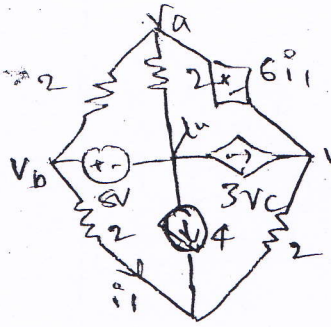
Course Coordinator

HOD

I - IA SCHEME OF EVALUATION

Sem : IV	Subject : Network Analysis	Sub Code : 15EC34	Date : 15/09/17

Q. No.	Bit	Description	Marks	Mapped CO's
4	a	Find the Node voltages Vd & Vc using Nodal Analysis	7	C204.1



$\frac{V_a}{2} + \frac{V_a - V_d}{2} + \frac{V_d}{2} - 3V_c = 0$ — (1)

$V_b = 8V$ — (2)

$V_a - 3V_b + 3V_c - V_d = 0$ — (A)

$0 - 0.5V_b + V_c + 0.5V_d = 4$ — (B)

$V_a - 0.5V_b + 3V_c + 0.5V_d = 0$ — (C)

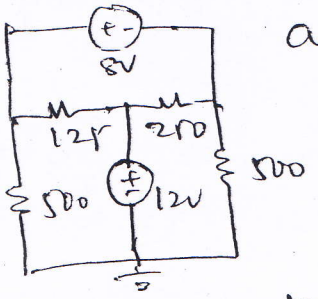
$V_a + 3V_c - V_d = 24$ — (I)

$0 + V_c - 0.5V_d = 8$ — (II)

$V_a - 3V_c + 0.5V_d = 4$ — (III)

$V_a = 9.14V$
$V_b = 8V$
$V_c = -1.14\ V$
$V_d = -18.28V$

4	b	Find the Node voltages at V_1, V_2, V_3 using Nodal analysis		



at V_1 & V_3

$V_1\left(\frac{1}{500} + \frac{1}{12}\right) - V_2\left(\frac{1}{12} + \frac{1}{24}\right) + V_3\left(\frac{1}{500} + \frac{1}{24}\right) = 0$

$10MV_1 + 6MV_3 = 12M \times 12$ — (1)

$V_1 - V_3 = 8$ — (2)

$V_1 = 12V$
$V_2 = 4V$

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Module Coordinator

HOD

SECOND INTERNAL ASSESSMENT

Sem: III | Sub: Network Analysis | Sub. Code: 15EC34
Date: 16/10/17 | Time: 3:00pm-4:00pm | Max. Marks: 25

Note: Answer two full questions, draw sketches wherever necessary.

Q. No		Discription of Question	Marks	CO
1	a	State & Explain Maximum power transfer theorem when load impedence consisting of variable resistance and variable reactance.	6	C204.2
	b	For the network shown in Fig.1 draw the thevenins equivalent circuit.	6	C204.2
		OR		
2	a	Using Millman's theorem find I_L through R_L for the network shown in Fig.2.	6	C204.2
	b	Find the current through 16 Ω resistor using Nortons theorem in Fig.3.	6	C204.2
3	a	Find the value of load resistance when maximum power is transferred across it and also find the value of maximum power transferred for the n/w in Fig.4	7	C204.2
	b	Define following terms 1.Resonance 2. Q Factor 3. Selectivety 4.Bandwidth	6	C204.3
		OR		
4	a	State and Prove Reciprocity Theorem.	7	C204.2
	b	Derrive Expression for Quality Factor of Series Resonant circuit.	6	C204.3

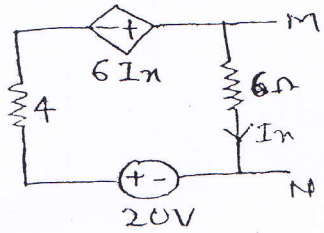


Fig. 1

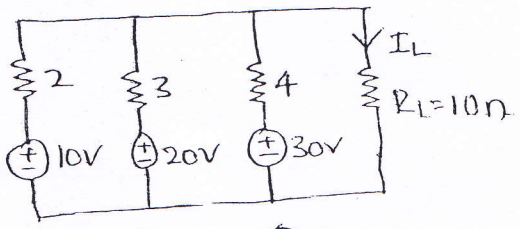


Fig. 2

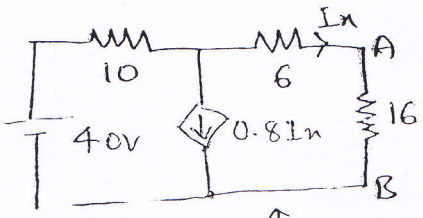


Fig. 3

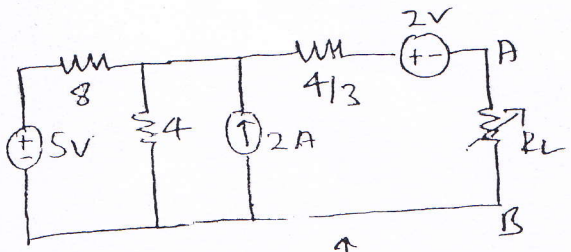


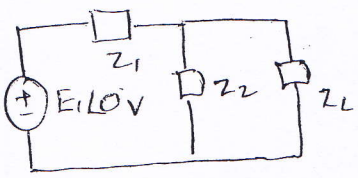
Fig. 4

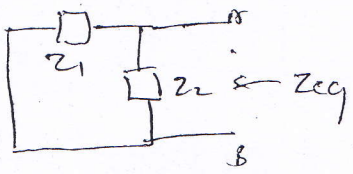
HOD

II - IA SCHEME OF EVALUATION

Sem : III	Subject : Network Analysis	Sub Code : 15EC34	Date : 16/10/17

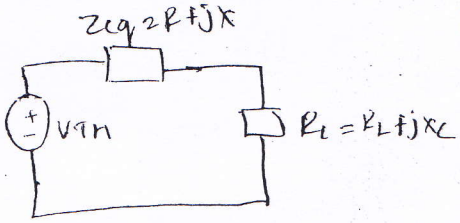
Q. No.	Bit	Description	Marks	Mapped CO's
1	a	Maximum power transfer theorem when load impedence consisting of variable resistance & variable reactance	6	C204.2





$Z_{eq} = R + jX$

$Z_L = R - jX$

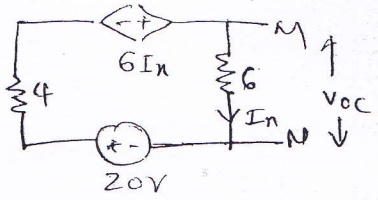


$$I = \frac{V_{th}}{\sqrt{(R+R_L)^2 + (X+X_L)^2}}$$

$X_L = -X$

$R = R_L$

	b)	Thevenin equivalent CKT	6	C204.2



$V_{OC} = 30V$

$I_{SC} = 5A$

$R_{th} = 6\Omega$

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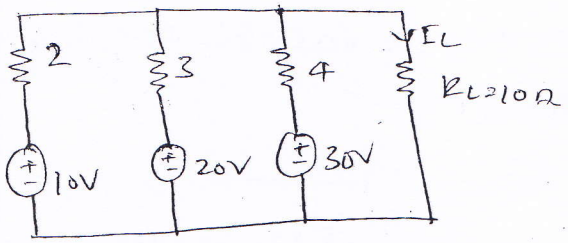
Module Coordinator

II IA SCHEME OF EVALUATION

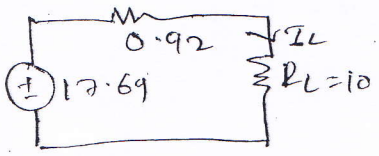
Sem : III	Subject : NA	Sub Code : 15E434	Date : 16/10/17

Q. No.	Bit	Description	Marks	Mapped CO's
2	a	Millman's theorem to find I_L through R_L	6	C204.2



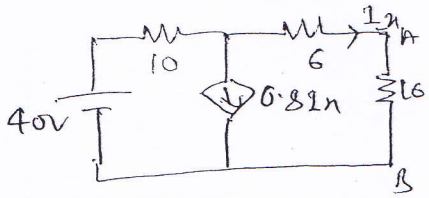
$E = 17.68V$

$Z = 0.92V$



$I_L = 1.619A$

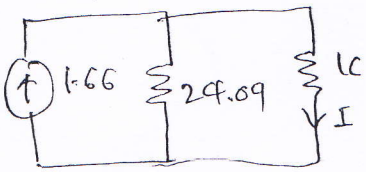
2	b)	Current through 16Ω Resistor using Norton's theorem	6	C204.2



$V_{OC} = 40V$

$I_{SC} = 1.66$

$R_{TH} = \frac{V_{OC}}{I_{SC}} = \frac{40}{1.66} = 24.09$



$I = 0.997$

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Module Coordinator

II - IA SCHEME OF EVALUATION

Sem : III	Subject : MA	Sub Code : 15EC34	Date : 16/10/17

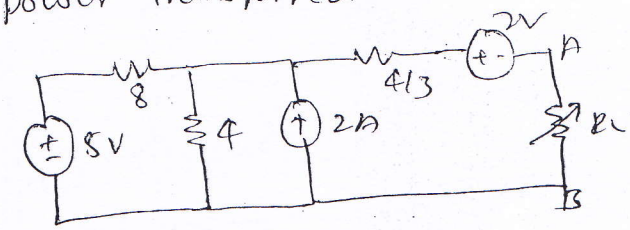
Q. No.	Bit	Description	Marks	Mapped CO's
4	a)	Definition & Explanation for the Reciprocity theorem	7	C204.2
4)	b)	Expression for Quality Factor in a Series resonant CKT	6	C204.3

Course Coordinator

Module Coordinator

IV - IA SCHEME OF EVALUATION

Sem : IV	Subject : NA	Sub Code : 15EC54	Date : 16/10/17

Q. No.	Bit	Description	Marks	Mapped CO's
3	a)	Maximum value of resistance & maximum power transferred  $V_{OC} = V_{TH} = 5V$ $R_{TH} = 4$ $P_{max} = 1.6W$	7	C204.2
3	b)	Defination for the following 1) Resonance – 1.5M 3) selectivity – 1.5M 2) Q Factor – 1.5M 4) Bandwidth – 1.5M	6	C204.2

Course Coordinator

Module Coordinator

THIRD INTERNAL ASSESSMENT

Sem: III **Sub: Network Analysis** **Sub. Code: 15EC34**
Date: 19/11/17 **Time: 3:00pm-4:00pm** **Max. Marks: 25**

Note: Answer two full questions, draw sketches wherever necessary.

Q. No		Discription of Question	Marks	CO
1	a	Calculate half power frequencies of series resonant circuit where the resonance frequency is 150KHz & Bandwidth is 75KHz.	7	C204.3
	b	A series RLC circuit has R=4Ω ,L=1mH , & C=10uF Calculate Q Factor ,Bandwidth resonant frequencies & Half power frequencies f1 & f2.	6	C204.3
		OR		
2	a	A 220V, 100Hz AC source supplies a series RLC ckt with a capacitor & a coil. If the coil has 50m Ω resistance and 5mH inductance,Find the at a resonance frequency of 100Hz what is the value of capacitor. Also calculate the Q factor & half power frequencies of the ckt.	7	C204.3
	b	Find the value of R1 in the given ckt Fig.1 at resonant .	6	C204.3
3	a	Obtaine Relation between Y & H parameter.	6	C204.4
	b	Determine Y parameter of 2 port n/w shown in Fig.2.	6	C204.4
		OR		
4	a	For the n/w shown below in Fig.3 Find the Z parameter.	6	C204.4
	b	For the ckt shown below Fig.4 K is changed from position 1 to 2 at t=0 Find the values of I,di/dt,d^2i/dt^2 at t=0+	6	C204.5

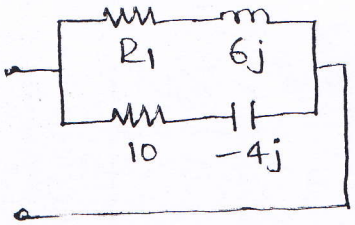


Fig.1

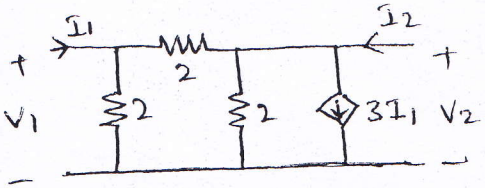


Fig. 2

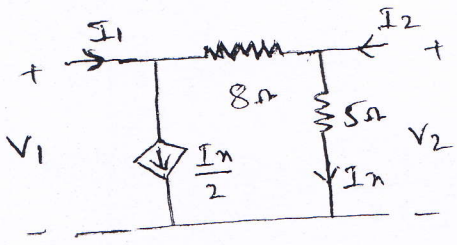


Fig.3

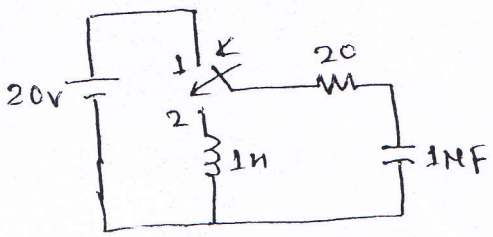


Fig. 4

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Module Coordinator

HOD

III - IA SCHEME OF EVALUATION

Sem : III	Subject : MA	Sub Code : 15EC34	Date : 19/11/17

Q. No.	Bit	Description	Marks	Mapped CO's
1	a)	$f_r = 150KHz = \sqrt{f_1 f_2}$ $BW = 75KHz = f_2 - f_1$ $f_1 f_2 = 22.5 \times 10^9$ $f_1(75K + f_1) = 22.5 \times 10^9$ $f_1 = 117.1\ KHz$ $f_2 = 192.16\ KHz$	7	C204.3
1	b]	$R = 4, L = 1MH, C = 10MF,$ $Q = \frac{1}{R}\sqrt{\frac{L}{C}} = Qs = 2.5$ $BW = 636.53Hz$ $BW = R/2\pi L$ $f_r = \frac{1}{2\pi\sqrt{LC}} = 1.59KHz$ $f_1 = 1.303KHz$ $f_2 = 1.940KHz$	6	C204.3
2	a)	$\therefore f_0 = \frac{1}{2\pi\sqrt{LC}}, C = 0.506MF$ $Q = \frac{1}{R}\sqrt{\frac{L}{C}} = 62.83$ $BW = f_2 - f_1 = \frac{R}{2\pi L} = 1.591$ $f_2 = 100.79$ $f_1 = 99.20$	7	C204-3

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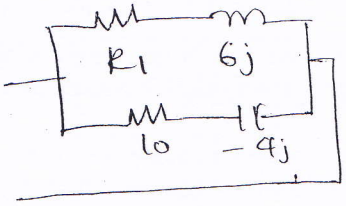
III - IA SCHEME OF EVALUATION

Sem : III	Subject : NA	Sub Code : 15EC34	Date : 19/4/17

Q. No.	Bit	Description	Marks	Mapped CO's
2	b	 $Y_T = Y_L + Y_C$ $= \frac{1}{Z_L} + \frac{1}{Z_C}$ $= \frac{1}{R_1+6j} + \frac{1}{10-4j}$ $= \frac{R_1-6j}{R_1^2+36} + \frac{10+4j}{100+16}$ $= \left(\frac{R_1}{R_1^2+36} + \frac{10}{116}\right) + j\left(\frac{4}{116} - \frac{6}{R_1^2+36}\right)$ $\frac{4}{116} - \frac{6}{R_1^2+36} = 0$ $\boxed{R_1 = 11.74\ \Omega}$	6	C204-3
3	a	Relation betn Y & H parameter $\begin{bmatrix} Y_{11} & Y_{12} \\ Y_{21} & Y_{21} \end{bmatrix} = \begin{bmatrix} 1/h_{11} & -h_{12}/h_{11} \\ h_{21}/h_{11} & \Delta h/h_{11} \end{bmatrix}$	6	C204.4
	b	Y parameter $Y_{11} = 1\mho$, $Y_{12} = -0.5\mho$ $Y_{21} = 2.5$, $Y_{22} = -0.5\mho$	6	C204.4

Course Coordinator

Module Coordinator

HOD

III - IA SCHEME OF EVALUATION

Sem : III	Subject : NA	Sub Code : 15EC34	Date : 14/11/17

Q. No.	Bit	Description	Marks	Mapped CO's
4	a	Z parameter for the n/w $Z_{11} = \frac{26}{3} = 8.66$ $\quad Z_{21} = \frac{10}{3} = 3.33$ $Z_{12} = \frac{2}{3} = 0.66$ $\quad Z_{22} = 10/3 = 3.33$	6	C204.4
	b	$i(0-) = i(0+) = 1\,A$ $\frac{di(0+)}{dt} = -20\,A/sec$ $\frac{di^2(0+)}{dt} = -0.99M\,A/sec^2$ Steady state $i(0+) = i(0+) = 0$ $\frac{di(0+)}{dt} = -20\,A/sec$ $\frac{d^2i(0+)}{dt^2} = 400\,A/sec^2$	6	C204.4

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