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Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.

Re Exam May 2016

Max. Marks: 100
Class: S.Y. B. Tech. Electrical
Program: Electrical Engineering
Name of the Course: Analog Circuits

Duration: Three Hours
Semester: III

Course Code : BTE227

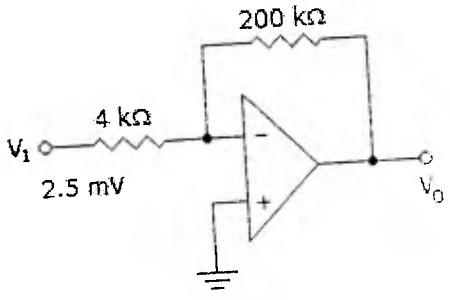
Master file.

Instructions:

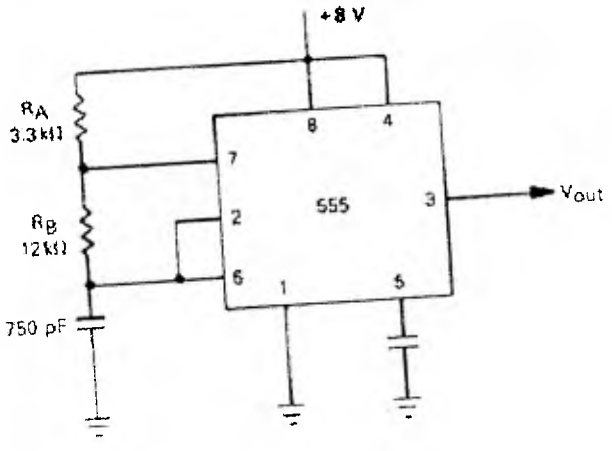
- Question No. 1 is compulsory
- Attempt **any Four questions** out of remaining SIX questions.
- Answer to all sub questions should be grouped together.
- Figures to the right indicate **full marks.**

Q. No			Max. Marks	Course Outcome Number	Moc No.
1	(i)	For the circuit of Wein Bridge Oscillator using opamp, the component values used are, R= 5.1 KΩ, C = 1nF, for the feedback network. R_1 = 5.1 KΩ and R_f = 12 KΩ for opamp. Draw circuit diagram. Determine whether the circuit will oscillate or not. If yes, obtain the output frequency.	**05**	CO 7	7
	(ii)	State and explain Miller's Theorem	**05**	CO 1	2
	(iii)	Explain how IC 7805 can be used to supply a current of 1A to a 10Ω, 10W load.	**05**	CO 4	4
	(iv)	Why power amplifier is used usually in the last stage of the electronic system. Justify	**05**	CO 2	1
2	A	A transformer coupled class A power amplifier is to be designed with specifications given. Output ac power 25 watts, load resistance 4Ω, D.C. supply voltage 24V. Efficiency of the transformer is 80%, $S_{ICO} \leq 8$. Two transistors available are 2N3055[P_{Dmax} = 115.5W, I_{Cmax} = 15A, V_{CEO} = 60V] ECN149 [P_{Dmax}= 30 W, I_{Cmax} = 4A, V_{CEO} = 40 V] Select proper transistor. Justify the same.	**10**	CO 2	1
	B	What is crossover distortion? How is it eliminated?	**05**	CO 2	1
	C	What is the need of heat sink for power amplifiers?	**05**	CO 2	1
3	A	With the help of neat circuit diagram and waveforms, show how IC 555 can be used as monostable multivibrator. In the above circuit if R = 100 KΩ, Calculate value of C for the time delay T = 100 mS.	**10**	CO 3	3

	B	Explain low voltage regulator using IC 723.	**10**	CO 4	4
4	A	Explain how the frequency response of CE BJT amplifier changes with and without R_E bypassed .	**14**	CO 1, CO 5	2,6
	B	Determine the bandwidth of the amplifier shown below if UGB of opamp is 1 MHz	06	CO 1	2



5	A	With the help of block diagram explain current series feedback. With proper circuit diagram discuss its application.	**12**	CO 5	6
	B	What is the effect of voltage series feedback on input impedance, output impedance, voltage gain and bandwidth?	**08**	CO 5	6
6	A	With neat circuit diagram explain RC phase shift oscillator using FET. Select proper components to get frequency of oscillations as 2 KHz.	**12**	CO 7	7
	B	What is the main advantage of crystal oscillator over RC oscillators?	**08**	CO 7	7
7		Calculate component values needed for first order Butterworth HPF at cutoff frequency 2 kHz and passband gain of 2. Draw circuit diagram.	**05**	CO 6	5
		How filters are classified based on frequency response?	**10**	CO 6	5
		Determine t_{HI} and t_{LO} for the circuit given below.	**05**	CO 3	3



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Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Re-Examination
May 2016

Max. Marks: 100 Duration: 03 hours
Class: S.Y.Btech Semester: III Program:Electrical.
NameoftheCourse:EngineeringMathematics-III
CourseCode : BTE201

Master file.

Instructions:
1) Answers to sub questions are to be grouped together otherwise **NO MARKS WILL BE AWARDED.**
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and draw proper figures where ever required.
4) Answer the questions in detail.
5) Attempt any five out of seven questions.

Q No.		Max marks	Course outcome	Module number
Q1a)	Evaluate $L\{(t+2)^2 e^t\}$	6	1	1
b)	Obtain the Fourier Series for $f(x)=x$ in $(0,2\pi)$	6	3	3
c)	Verify Green's theorem in the plane for $\oint_c (3x^2-8y^2)dx+(4y-6xy)dy$ where C is the boundary of region defined by $x=0$, $y=0$ & $x+y=1$.	8	4	6
Q2 a)	Find Fourier series of $f(x)=\lvert x\rvert \quad -2<x<2$	6	3	3
b)	Evaluate $\oint_c \frac{\sin^2 z}{\left(z-\frac{\pi}{6}\right)^3}dz$ where c is the circle $\lvert z\rvert=1$	6	2	7
c)	Prove that $\int_0^\infty e^{-2t}\sin^3 t\, dt=\frac{6}{65}$	8	1	1
Q3 a)	Obtain the Fourier series for $f(x)=\begin{cases}1+\frac{2x}{\pi} & -\pi<x<0\\ 1-\frac{2x}{\pi} & 0<x<\pi\end{cases}$	6	3	3

b)	Evaluate $L^{-1}\left\{\frac{3s+7}{s^2-2s-3}\right\}$	6	1	2
c)	Prove that $\nabla\left(r^2e^r\right)=(r+2)e^r\vec{r}$	8	4	5
Q4 a)	Evaluate using residue theorem $\oint_C \frac{z}{(z-1)(z-2)^2}dz$ $C=\lvert z-2\rvert=\frac{1}{2}$	6	2	7
b)	Calculate the angle between the normal to the surface $xy=z^2$ at the points $(4,1,2)$ and $(3,3,-3)$	6	4	5
c)	If $f(x)=\sin x \quad 0\le x\le\pi$ Find half range cosine series	8	3	3
Q5 a)	If $f(x)=x \quad 0\le x\le 2$ Find half range cosine series using Parseval's identity deduce $\frac{\pi^4}{96}=\frac{1}{1^4}+\frac{1}{3^4}+\frac{1}{5^4}+------$	6	3	4
b)	Evaluate using residue theorem $\int_0^{2\pi}\frac{d\theta}{2+\cos\theta}$	6	2	7
c)	Solve using Laplace transforms $y''+y=t$ Given $y(0)=1 \quad y'(0)=-2$	8	1	2
Q6 a)	Show that $\{\sin(2n+1)x\}$ is orthogonal on $\left[0,\frac{\pi}{2}\right]$ and construct corresponding orthonormal set of functions.	6	3	4
b)	Evaluate $L^{-1}\left\{\log\left(1+\frac{1}{s^2}\right)\right\}$	6	1	2
c)	Verify Stoke's theorem for the vector field $\vec{F}=(x^2-y^2)\hat{i}+2xy\hat{j}$ over the box bounded by planes x=0, x = 1, y = 1, z = 1 if the face z = 0 is cut.	8	4	6
Q 7 a)	Solve using convolution theorem $L^{-1}\left\{\frac{s}{(s^2+4)(s^2+1)}\right\}$	6	1	2
b)	Evaluate $L\left\{e^{-2t}\frac{\sin 2t\cosh t}{t}\right\}$	6	1	1
c)	Verify Divergence Theorem for $\vec{F}=(x^2-yz)\hat{i}+(y^2-zx)\hat{j}+(z^2-xy)\hat{k}$ taken over the rectangular parallelepiped $0\le x\le 1, 0\le y\le 1, 0\le z\le 1$.	8	4	6

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Re – Examination
June 2016

Max. Marks: 100
Class: SY BTech
Name of the Course: **Electrical Networks**

Semester: III

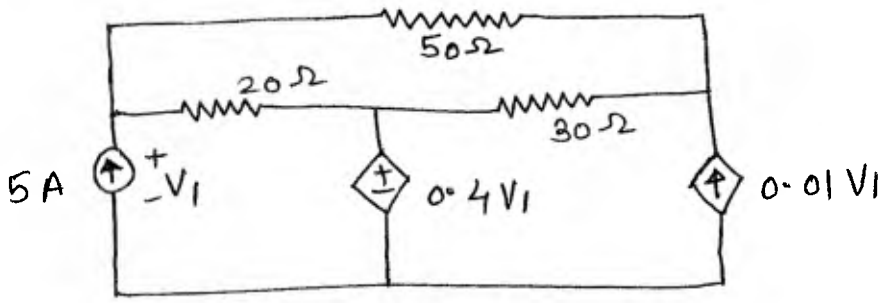
Duration: 3 Hr.
Program: Electrical
Course Code : **BTE203**

Master file.

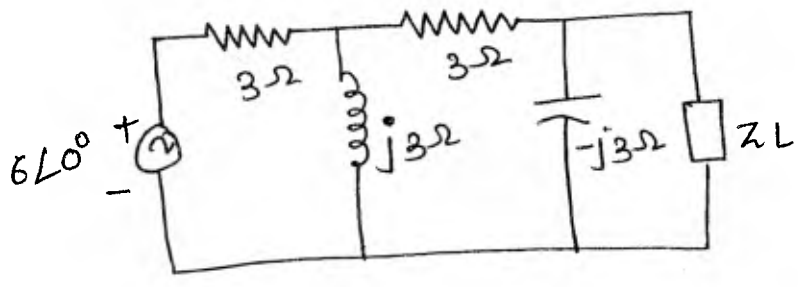
Instructions:

- Attempt any FIVE question out of Seven questions
- Answers to all sub questions should be grouped together
- Figures to the right indicate full marks
- In the absence of any data, make suitable assumptions and justify the same.

Q. No		Max. Marks	CO No.	Module No.
Q1a	For the network find current supplied by all the sources.	(10)	01	01

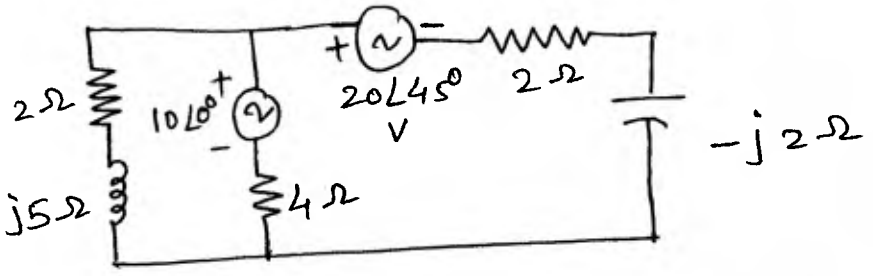


b	Find Z_L for maximum power transfer. Also determine the maximum power drawn by the load.	(10)	01	01

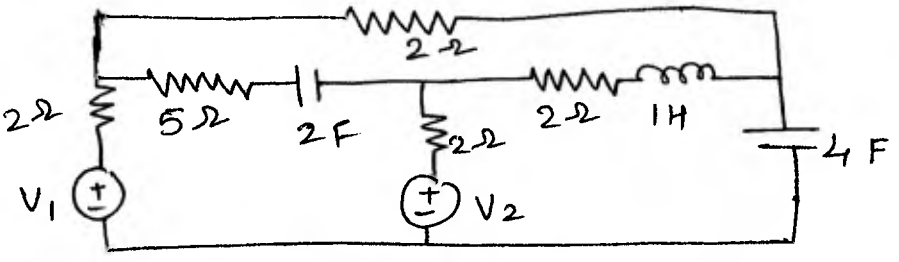


Q2a	A series RLC circuit has the following parameters R= 10 Ω, L= 0.01H and C = 100 μF. Calculate the resonant frequency, bandwidth, lower cut-off and upper cut-off frequency.	(10)	01	01

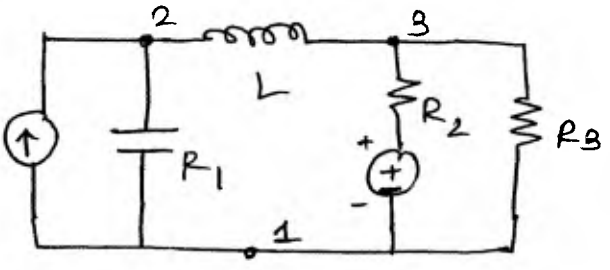
b Find the voltage drop across the capacitor for the network shown below. (10) 01 01



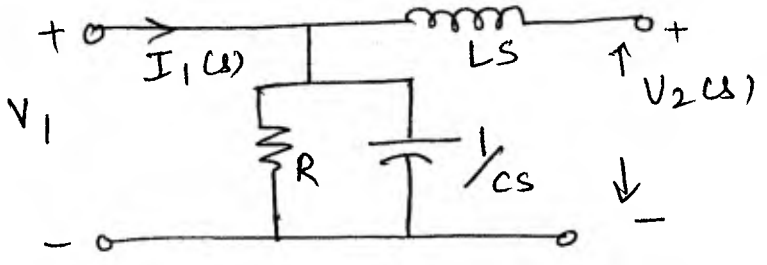
Q3a For the network shown below draw oriented graph. Determine Incidence Matrix, Tie-set matrix and f- cutest matrix. (10) 02 02



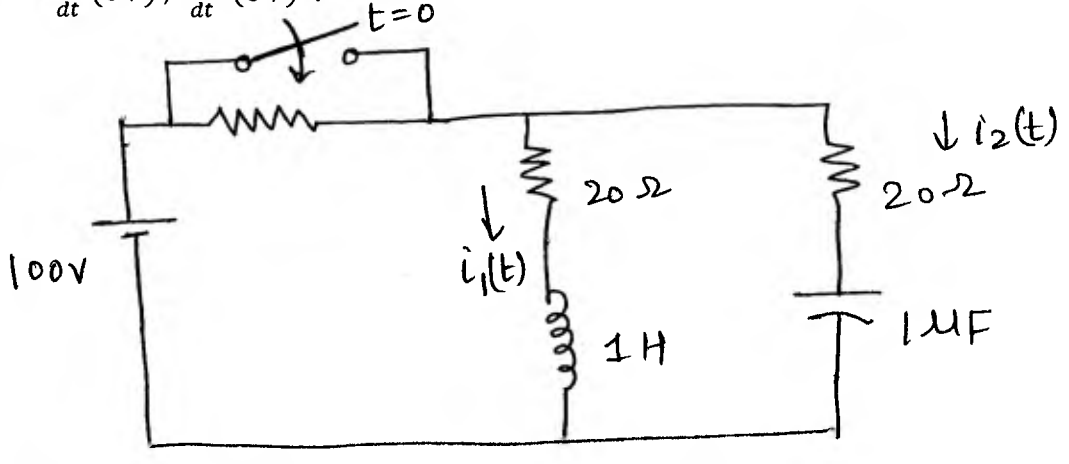
b How many graphs are possible for the graph of network shown below. (05) 02 02



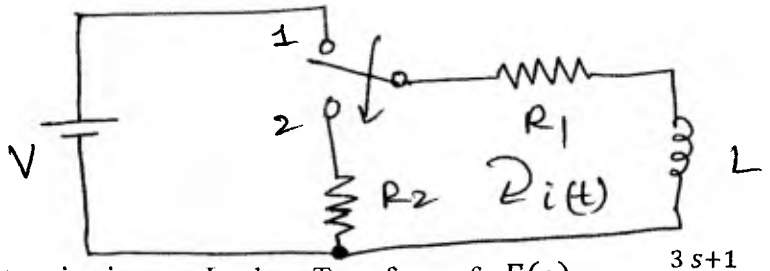
c Find transfer impedance $Z_{12}(s)$ of the network shown below. (05) 06 05



Q4a For a given network shown below, steady state is reached with the switch open. At t = 0, the switch is closed. Find $v_c(0-), i_1(0+), i_2(0+)$, $\frac{di_1}{dt}(0+), \frac{di_2}{dt}(0+)$. (10) 03 03

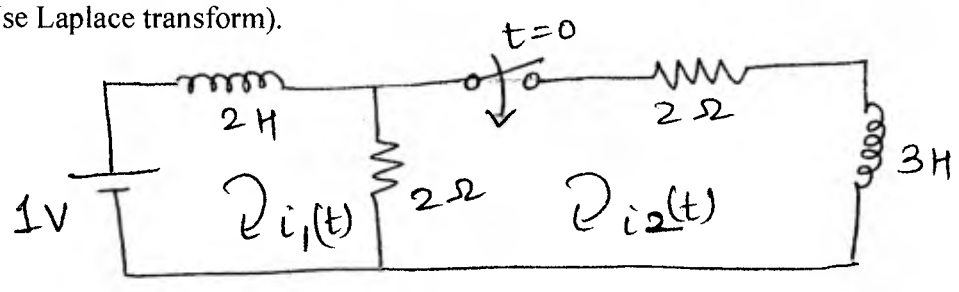


b In the network given below switch is initially in position 1. At t = 0, switch is changed to position 2. Determine and plot the current i(t) for $t \geq 0$. Also determine time constant of the circuit. (10) 03 03

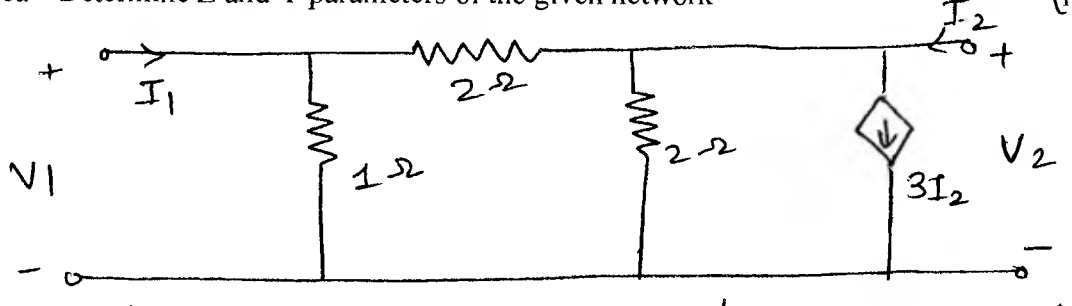


Q5a Determine inverse Laplace Transform of $F(s) = \frac{3s+1}{(s+1)(s^2+2)}$. (10) 04 04

b In the network given below determine current through inductors for $t \geq 0$. (Use Laplace transform). (10) 03 & 04 03 & 04

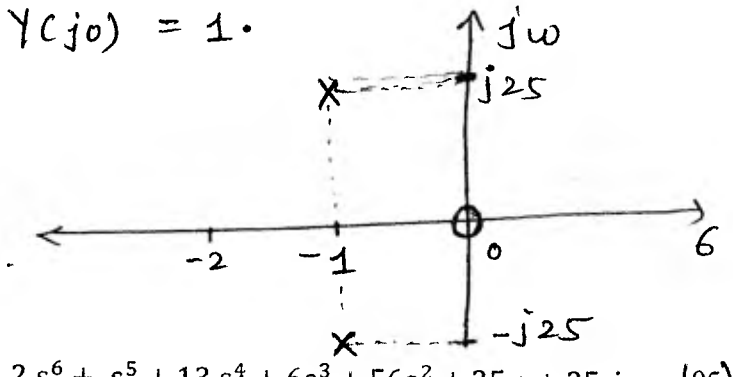


Q6a Determine Z and Y parameters of the given network (10) 06 06



b A series RLC circuit has driving point admittance has pole zero plot as shown in following figure. Determine values of R, L and C. Comment on the stability of system. (10) 05 & 06 05

Y(jo) = 1.



Q7a Test if polynomial $2s^6 + s^5 + 13s^4 + 6s^3 + 56s^2 + 25s + 25$ is Hurwitz. (05) 06 07

b Test whether $F(s) = \frac{s(s+3)(s+5)}{(s+1)(s+4)}$ is positive real function. (05) 06 07

c Realize Foster forms of RC impedance function $Z(s) = \frac{2(s+2)(s+4)}{(s+1)(s+3)}$ (10) 06 07