Paper Id: 130323 Roll No:

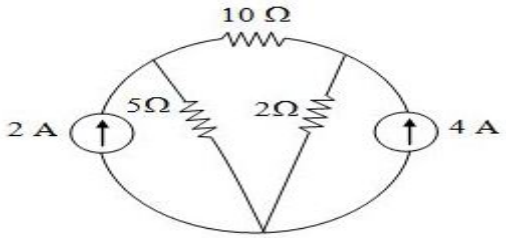
B.TECH
(SEM-III) THEORY EXAMINATION 2019-20
NETWORK ANALYSIS & SYNTHESIS

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

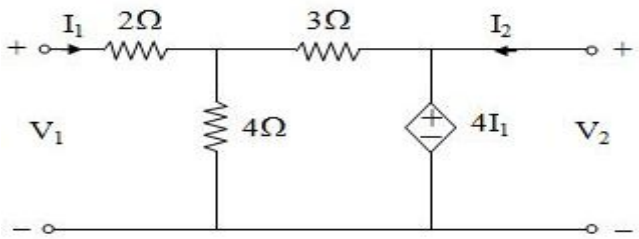
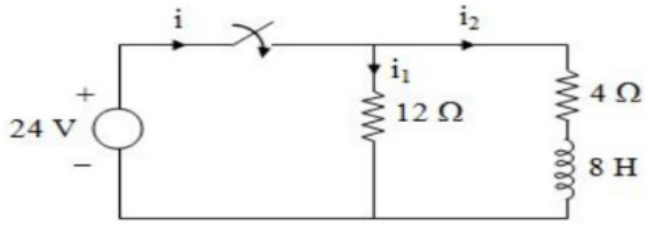
SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

Qno.	Question	Marks
a.	Explain the concept of Complex Frequency.	2
b.	Define "Transfer function" of a network.	2
c.	State two properties of the R-C driving point Impedance function.	2
d.	Find the Laplace transform of $x(t) = e^{-at} \sin \omega_o t$	2
e.	Find Current in 10ohm resistor as shown in fig: 	2
f.	Draw the Dual Circuit of Parallel RLC circuit with Current Source.	2
g.	What are the Dependent & Independent terms in the Z- parameter?	2
h.	State Compensation Theorem.	2
i.	Give examples of Active & Passive elements in a Network.	2
j.	Draw the Frequency Resonance Curve of Parallel Resonance R-L-C Circuit.	2

SECTION B

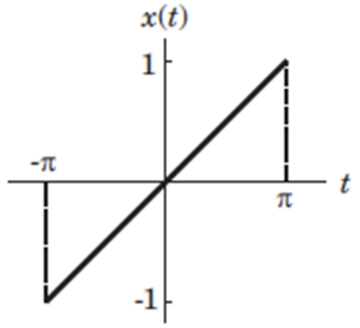
2. Attempt any *three* of the following:

Qno.	Question	Marks
a.	Find Y and Z parameters of the networks as shown in fig 	10
b.	Explain Low pass Filter, High Pass Filter, Band Pass Filter, Band Reject Filter.	10
c.	Find the current i_2 for t > 0 in the circuit shown below as shown in fig 	10

d.	Explain Maximum Power Transfer Theorem related to AC Circuits.	10
e.	Calculate the inverse Laplace Transform h(t) of given transfer function $$H(s)=\frac{s^2+5s-9}{(s+1)(s^2-2s+10)}$$	10

SECTION C

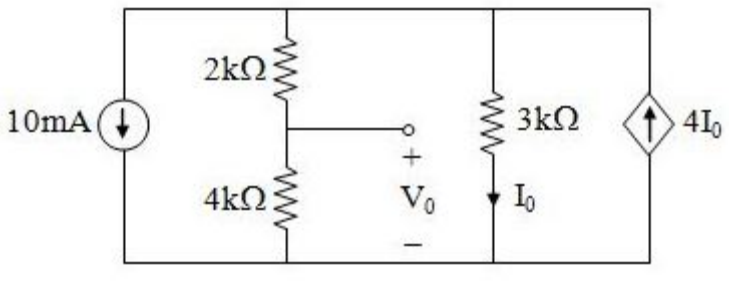
3. Attempt any *one* part of the following: (10 ×1=10)

Qno.	Question	Marks
a.	A Series R-L circuit has constant voltage V applied at t=0. At what time does $V_R=V_L$ happens.	10
b.	A periodic waveform whose one period is shown in fig. Determine the trigonometric Fourier series coefficients. 	10

4. Attempt any *one* part of the following: (10 ×1=10)

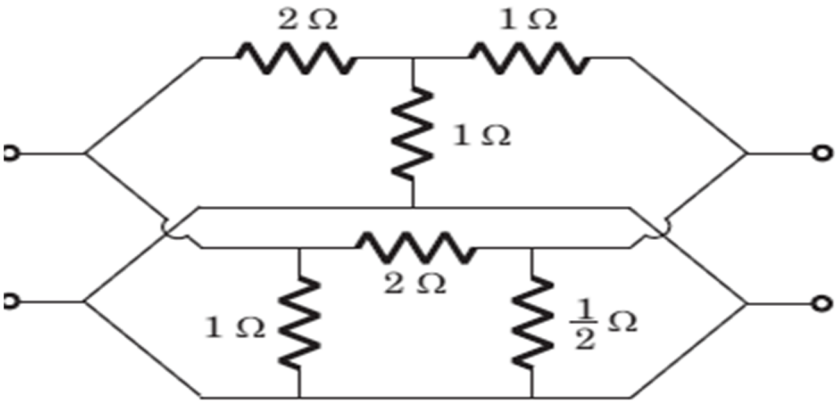
Qno.	Question	Marks
a.	Calculate the Inverse Laplace Transform using Convolution Integral. $$F(s)=\frac{1}{(s+a)(s+b)}$$	10
b.	For the Continuous time periodic signal $$x(t)=1+\cos\frac{2\pi}{3}t+4\cos\frac{5\pi}{3}t$$ Determine the Fundamental frequency w_0 & exponential Fourier series co-efficients.	10

5. Attempt any *one* part of the following: (10 ×1=10)

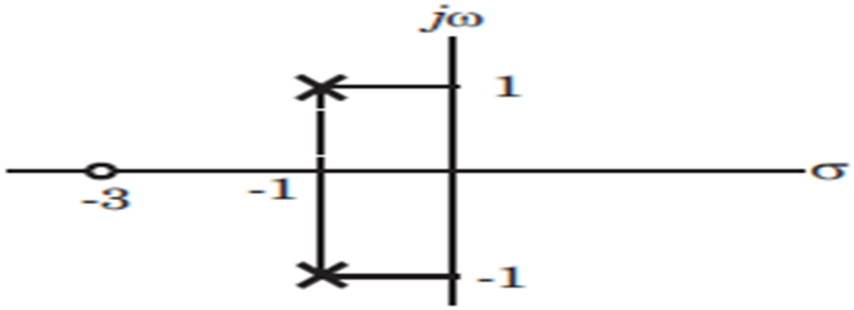
Qno.	Question	Marks
a.	For the given circuit in fig, the value of given voltage V_O across $4ohm$ resistance. 	10

b.	Calculate the Fourier transform of $\cos \omega_o t$ .Also Sketch its spectrum.	10

6. Attempt any *one* part of the following: (10 ×1=10)

Qno.	Question	Marks
a.	Calculate the Short Circuit Admittance Parameter of the given circuit in fig 	10
b.	Prove that for a symmetric network $Z_{11}=Z_{22}$, where Z_{11} & $Z_{22}$are Z-parameters.	10

7. Attempt any *one* part of the following: (10 ×1=10)

Qno.	Question	Marks
a.	Calculate the impedance Z(s),if Driving point impedance Z(s),of a network has pole-zero location as shown in fig . Also Z(0)=3 	10
b.	A Practical DC Current source provides 20kW to a 50 load & 20kW to a 200 load. Calculate the maximum power that can draw from it.	10