Printed Pages: 02 **Sub Code: EEC304**

Paper ID: | 3 | 0 | 2 | 4 | **Roll No.** | | | | | | | | | | |

B TECH
(SEM III) THEORY EXAMINATION 2017-18
FUNDAMENTALS OF NETWORK ANALYSIS AND SYNTHESIS

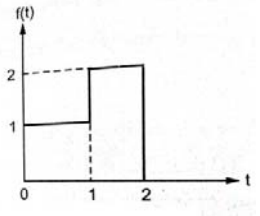
Time: 3Hours ***Max. Marks: 100***

Note: Attempt all Sections.

SECTION A

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

a) Determine the function for the given waveform-

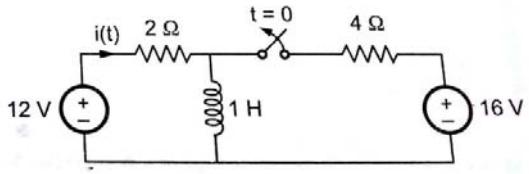


b) Write the properties of RC driving point function?
c) What are the different types of network function?
d) What is the condition for Symmetry of y-parameter and t-parameter?
e) What are the properties of Hurwitz polynomial?
f) Draw the waveform represented by the following function-
g) $f_1(t)= (t-1)u(t-1)$ (ii) $f_2(t)=tu(t+T)$
h) Write down the statement for Norton theorem with example?
i) Write the T-parameter in terms of Z-parameter?
j) What is the difference between active and passive filters?

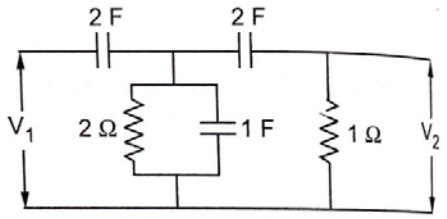
SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a) What is initial and final condition of network elements? Find i(t) for t > 0 when switch is opened at t = 0?

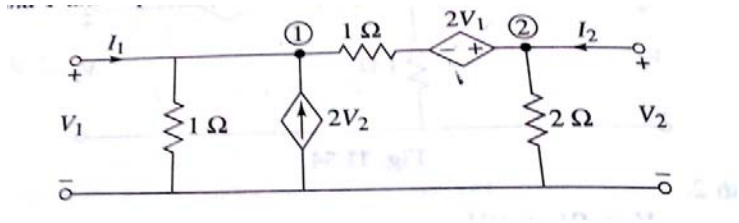


b) Obtain Voltage ratio transfer function for the given network-



c) For the given network function, draw pole-zero diagram and obtain the time domain response i(t). $I(s) = \dfrac{s^2 + 4s + 3}{s^2 + 2s}$

d) Find the Y-parameter for the network-



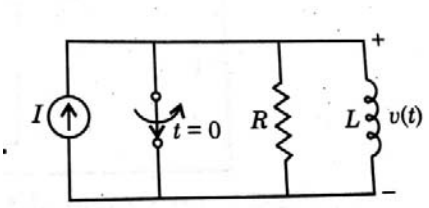
e) Test given function F(s) for positive realness?

$$F(s) = \frac{2s^3 + 2s^2 + 3s + 2}{s^2 + 1}$$

SECTION C

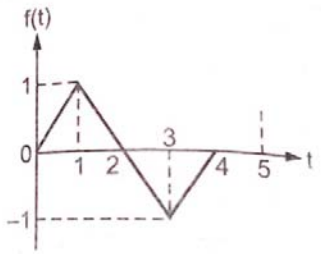
3. Attempt any *one* part of the following: **10 x 1 = 10**

a) The circuit shown is figure has the switch S opened at t=0. Solve for v, dv/dt and d^2t/dt^2 at t=0+, if I=1A R=100Ω and L=1H. Also find the expression for v(t).

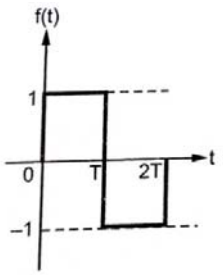


b) Write the expression for the waveform shown in the figure-

(i)

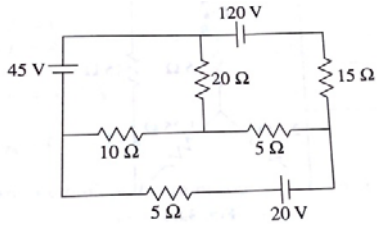


(ii)

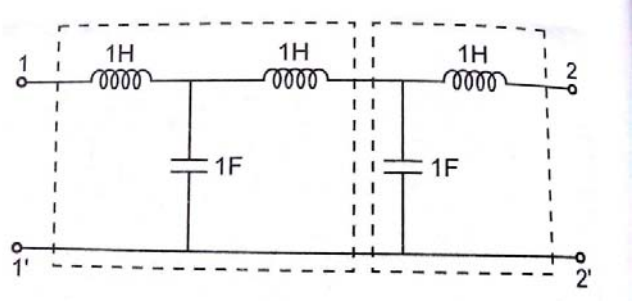


4. Attempt any *one* part of the following: **10 x 1 = 10**

a) Find the current through 20 Ω resistor using Thevenin theorem-



b) Find the T-parameter using the concept of interconnection of two given network-



5. Attempt any *one* part of the following: **10 x 1 = 10**

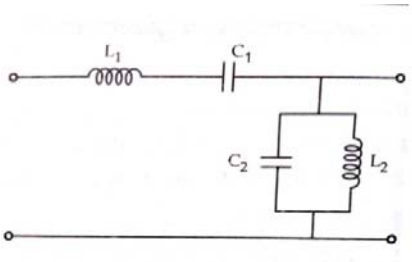
a) What are the properties of Positive real function? Test whether the polynomial is Hurwitz or not? $F(s) = s^7 + 2s^6 + 2s^5 + s^4 + 4s^3 + 8s^2 + 8s + 4$

b) Realize the Cauer forms of the following impedance function-

$$Z(s) = \frac{4(s^2+1)(s^2+9)}{s(s^2+4)}$$

6. Attempt any *one* part of the following: **10 x 1 = 10**

a) Define the zeros of transmission? Identify the zeros of transmission of the given network-



b) Synthesize $Y_{21}(s) = \frac{s^2}{s^3 + 3s^2 + 3s + 2}$ with 1Ω termination?

7. Attempt any *one* part of the following: **10 x 1 = 10**

a) Design first order high pass active filter and draw its frequency response?

b) Discuss the Non-inverting VCCS and CCVS circuit?