

D 23523

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Name.....

Reg. No.....

**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
DECEMBER 2011**

EC/AI 04 303—ELECTRIC CIRCUIT AND NETWORK THEORY



Time : Three Hours

Maximum : 100 Marks

- I. (a) Find the Laplace transform of $[u(t) - u(t - a)]$ if $u(t) = 1$, for $t \geq 0$ $u(t) = 0$ for $t < 0$.
(b) Find the Laplace transform of the waveform shown in Fig. 1.

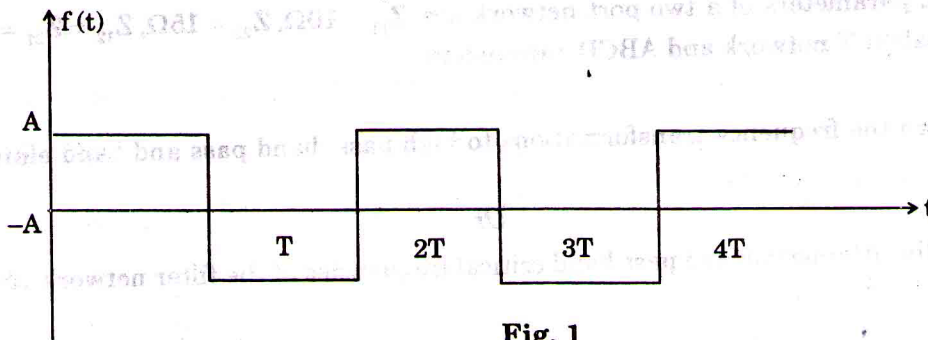


Fig. 1

- (c) List the applications of Bode plot.
(d) Explain the time domain behaviour from the pole-zero plot.
(e) Find the h-parameters for the network in Fig. 2.

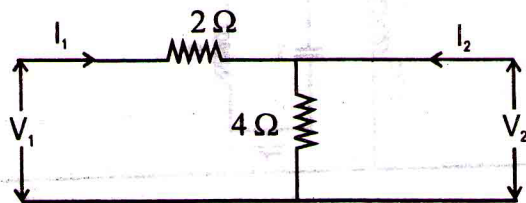


Fig. 2

- (f) List the types of attenuators.
(g) Explain the characteristics of Chebyshev filters.
(h) Write the basics of LP filter.

(8 × 5 = 40 marks)

- II. (a) Verify the initial and final value theorems for the function $f(t) = e^{-t}(\sin 3t + \cos 5t)$.

Or

- (b) Explain the use of Laplace transform in the transient analysis of RC networks with impulse and step inputs.

(15 marks)

Turn over

- III. (a) Draw the pole zero diagram for the given network function and hence obtain $u(t)$.

$$V(s) = \frac{4(s+2)s}{(s+1)(s+3)}$$

Or

- (b) Discuss the restriction of poles and zeros in the driving point and transfer function.

(15 marks)

- IV. (a) Discuss the parallel series and cascade connections of 2 port networks.

Or

- (b) The Z parameters of a two port network are $Z_{11} = 10\Omega$, $Z_{22} = 15\Omega$, $Z_{12} = Z_{21} = 5\Omega$. Find the equivalent T network and ABCD parameters.

(15 marks)

- V. (a) Explain the frequency transformations to high pass, band pass and band eliminations from LP.

Or

- (b) Find the attenuation and pass band critical frequencies of the filter network shown in Fig. 3.

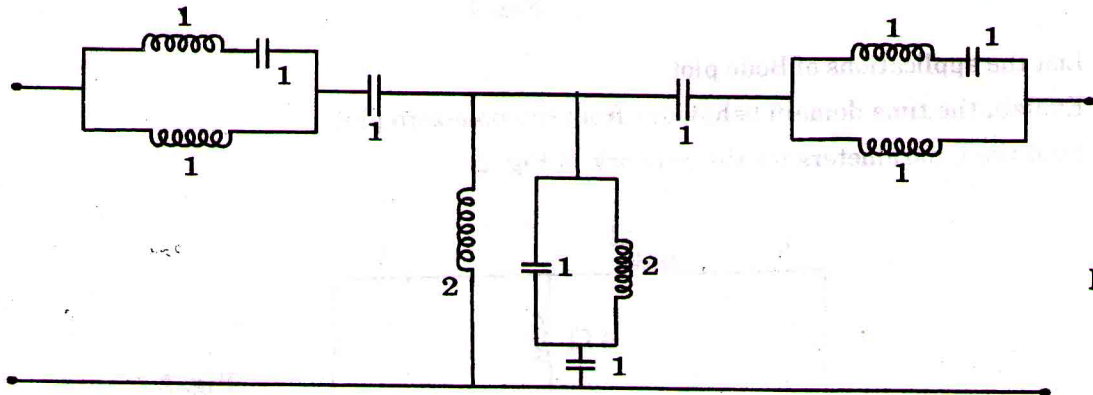


Fig. 3

(15 marks)

[4 × 15 = 60 marks]