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Total No. of Questions : 09]

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B.Tech. (ECE/Electronics & Computer Engg./ ETE) (Sem. - 3rd)

NETWORK ANALYSIS AND SYNTHESIS

SUBJECT CODE : BTEC - 303 (2011 & 2012 Batch)

Paper ID : [A1127]

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory** consisting of ten questions carrying two marks each.
2) Section - B contains **Five** questions carrying **Five** marks each and students has to attempt any four questions.
3) Section - C contains **Three** questions carrying **Ten** marks each and students has to attempt any two questions.

Section - A

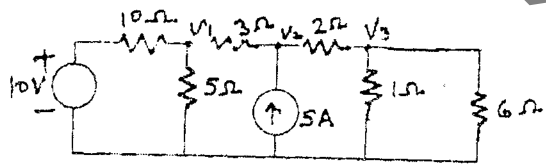
Q1)

a) What is meant by the term transients? Draw the transient response of R-L series circuits.

b) State Reciprocity theorem. Give example.

c) Classify different types of network elements.

d) Write the nodal equations for the following circuit.



e) Explain convolution theorem.

f) What are composite filters. How they are better than prototype and m-derived filters.

g) What are transfer functions? Give its significance.

h) Explain the behavior of an inductor at t = 0 and t = infinity when there is initial current in it.

i) What is meant by analysis and synthesis of a network.

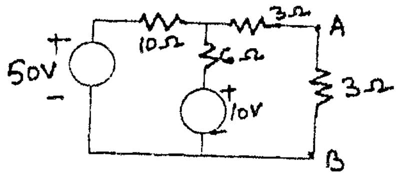
j) Differentiate between prototype filter and m-derived filters.

Section - B

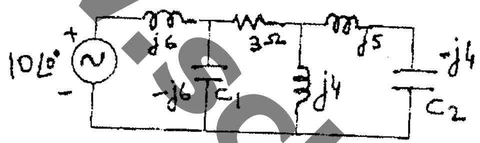
Q2) Explain time domain response from pole and zero plot. Plot the poles and zeros of a network function on the s-plane.

$N(s) = (s + 1)(s + 5)(s + 3 + 2j)(s + 3 - 2j)$ and check the stability of the system.

Q3) State Thevenin theorem. Find the current flowing in branch AB using thevenin theorem.



Q4) Find the voltage across capacitor C_1.



Q5) Test whether the polynomial $P(s) = S^3 + 4S^2 + 5S + 2$ is hurwitz.

Q6) Derive the Laplace transform of step, ramp, impulse and unit doublet function.

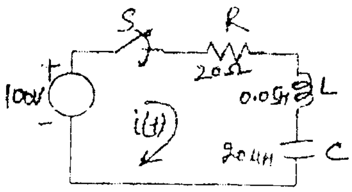
Section - C

Q7) Find the first and second Foster forms of the function

$Z(s) = (s + 1)(s + 3) / s(s + 2)$

Q8) Explain different characteristics of filters. Derive equations of Characteristics impedance, Propagation constant, attenuation and phase shift of T-network.

Q9) Determine the current i (t) in the given circuit when the switch is closed at t = 0.



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