B.Tech Sem – IV (2007 Course) (Electrical Engg.) : WINTER - 2017

SUBJECT : NETWORK ANALYSIS

Day : **Wednesday** Time **02.30 PM TO 05.30 PM**
Date : **22/11/2017** Max. Marks : 80

W-2017-2412

N.B.

1) Q.1 and Q.5 are **COMPULSORY.** Out of the remaining attempt any **TWO** questions from Section – I and any **TWO** questions from Section – II.
2) Figures to the right indicate **FULL** marks.
3) Draw diagrams wherever necessary.
4) Answer both the sections in **SEPARATE** answer book
5) Assume suitable data if necessary.

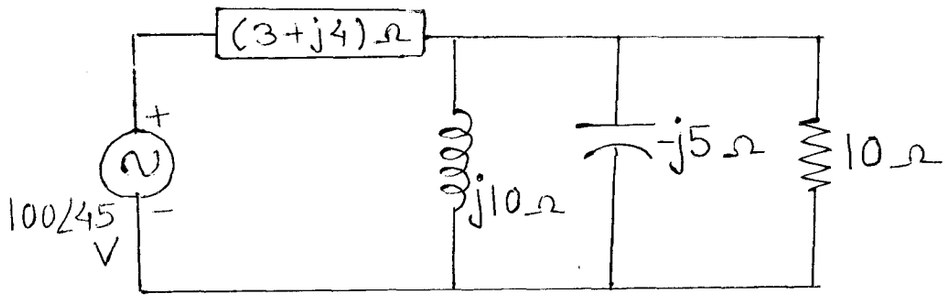
SECTION – I

Q.1 **a)** State and explain Thevenin's theorem. **(04)**

b) Derive the expression of current for the transient response of series R-C circuit having D.C. Excitation. **(05)**

c) State and explain initial value and final value theorem. **(05)**

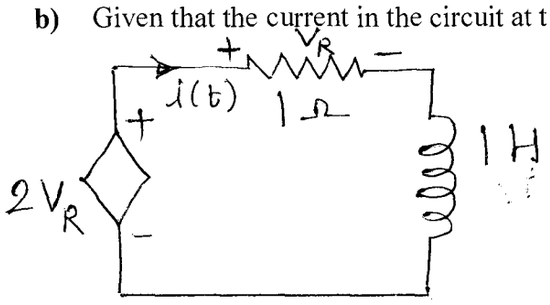
Q.2 **a)** Find the current through 10 Ω resistor using Thevenin's theorem. **(07)**



b) Derive the condition for maximum power transfer and also find then the expression for maximum power. **(06)**

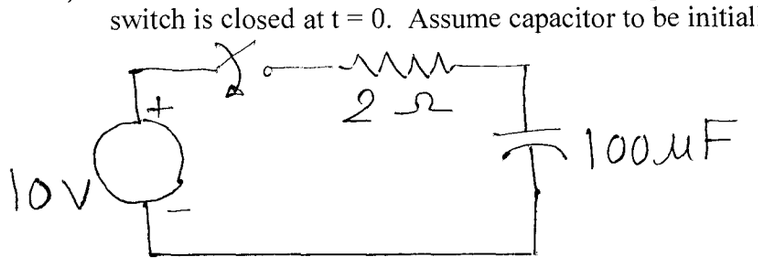
Q.3 **a)** A DC voltage of 100 V is applied to a coil having R = 100 Ω and L = 10 H. What is the value of the current 0.1 sec later the switching ON? What is value of the current 0.1 sec later the switching ON? What is the time taken by the current to reach half of its final value? **(07)**

b) Given that the current in the circuit at t = 0 is 5A, find i(t) at $t = 0^+$. **(06)**



Q.4 **a)** Draw and explain the following common forcing functions: **(06)**
i) Ramp function **ii)** Cosiusoidal function **iii)** Unit impulse function.

b) For the circuit shown, find the current through the capacitor at $t = 0^+$ if switch is closed at t = 0. Assume capacitor to be initially discharged. **(07)**



P.T.O.

SECTION – II

Q.5 **a)** Express Z parameters in terms of Y parameters. (Derivation) **(05)**

b) Explain the factors affecting the restrictions on location of poles and zeros in driving point functions. **(04)**

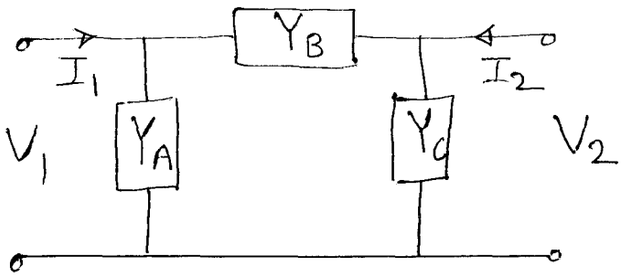
c) Derive condition of symmetry and reciprocity for open circuit parameters. **(05)**

Q.6 **a)** Draw the equivalent circuit for Z parameters if **(07)**

$Z_{11} = 10\ \Omega$, $Z_{12} = 10\ \Omega$

$Z_{21} = 6\ \Omega$, $Z_{22} = 13.33\ \Omega$

b) Find Y parameters for the following circuit. **(06)**



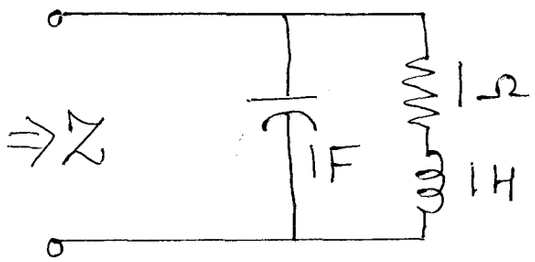
Q.7 **a)** State the expression and define the following terms in concern with 2 port network: **(06)**

i) Driving point impedance

ii) Driving point admittance

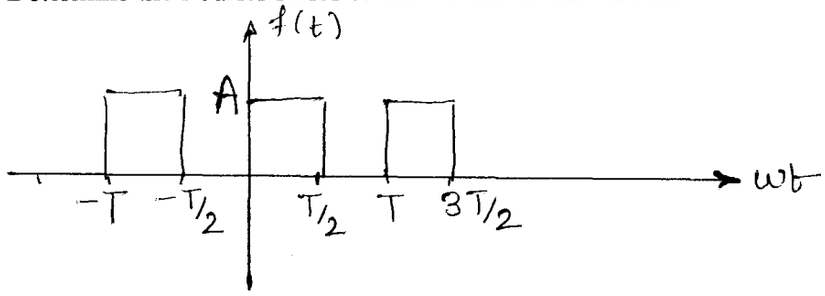
iii) Voltage and current transfer ratio.

b) Find the input impedance for the network shown. Also plot pole zero plot for it. **(07)**



Q.8 **a)** Explain the exponential form of Fourier series. **(06)**

b) Determine the Fourier series of the waveform shown below: **(07)**



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