Registration No: | | | | | | | | | | |

Total Number of Pages: 03

B.TECH
PEE3I101

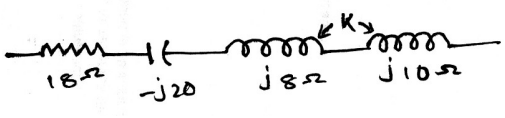
3rd Semester Regular Examination 2016-17
NETWORK THEORY
BRANCH: EE
Time: 3 Hours
Max Marks: 100
Q.CODE: Y646

Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.

Part – A (Answer all the questions)

Q1 **Answer the following questions:** **(2 x 10)**

a) State and explain reciprocity theorem
b) State and explain Milliman's theorem
c) For the series circuit find 'k' and place the dots such that circuit is in series resonance.



d) The shape of the transient current in loss free L – C circuit when excited from AC source
e) A two port network is defined as
$I_1 = 2V_1 + V_2$
$I_2 = 2V_1 + 3V_2$
Find Z_{12}
f) Explain the presence of harmonic in 3 phase circuits.
g) Explain how complex waves can be applied to RL & RLC circuits
h) Define reduced incidence matrix.
i) State the relation between tree branch and tree link.
j) State and explain compensation theorem.

Q2 **Answer the following questions:** **(2 x 10)**

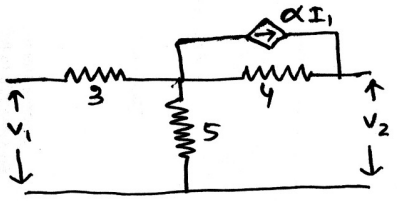
a) A system has input unit step and transfer function T(s) = $1/(s^2 + 3s+5)$ find output of the system at steadystate
b) What is the efficiency and power produced by the network at maximum power transfer condition.
c) Which theorem obey laws of conservation of energy.
d) Under what condition Norton theorem is applicable.
e) What is the condition of symmetry in two port network to obtain H parameter
f) What is the difference between incident graph and oriented graph.
g) What could be the maximum number of branches in a graph with n number of nodes.
h) Write the disadvantages of constant K filter.

i) Define coefficient of coupling.
j) State and explain thevnin theorem.

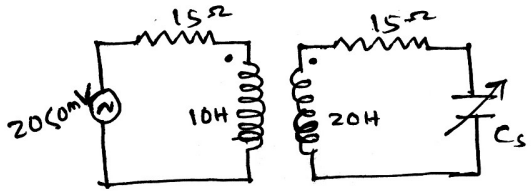
Part – B (Answer any four questions)

Q3 **a)** A series RC Circuit with R = 10 Ω and C = 4 μF as an initial charge of 800 μC on the capacitor at that time the switch is closed applying a constant voltage of 100 volt. Find resulting current transient if the charge is **(10)**
(i) of same polarity as deposited by source
(ii) of opposite polarity

b) Find H parameter of given network **(5)**



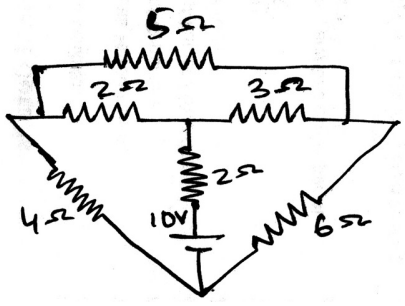
Q4 **a)** Find **(10)**
(i) value of C_S
(ii) input impedance
(iii) secondary current
(iv) voltage across the capacitor
input to primary is 20 mV at a frequency of 1MHz and secondary is tune to this frequency



b) For a 2-port network express A B C D parameters in terms of Y parameter. **(5)**

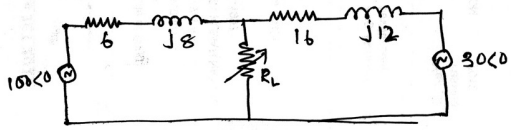
Q5 **a)** Derive all the expression for a T section band elimination filter with cutoff frequency f_1& f_2 and characteristics impedance. **(10)**

b) Draw the graph select a tree, write tieset and solve all branches current. **(5)**

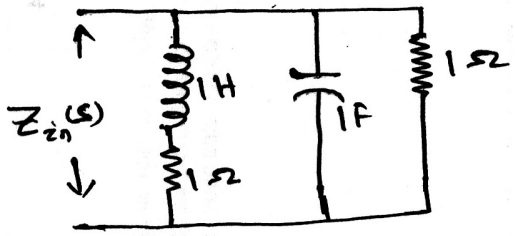


Q6 **a)** State and explain maximum power transfer theorem. **(10)**

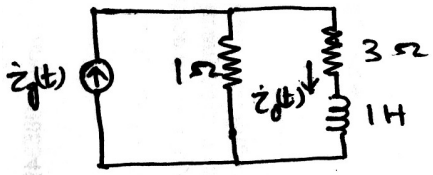
b) Find the value of R_L under maximum power condition. **(5)**



Q7 **a)** Find driving point impedance and draw pole – zero diagram. **(10)**

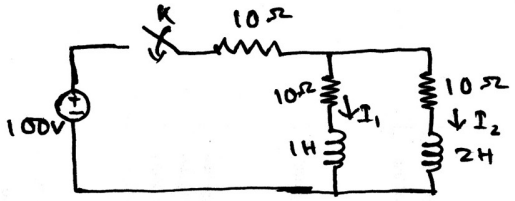


b) Use the fourier transform to find $i_0(t)$ in the circuit. **(5)**
$I_g(t) = 20sgn(t)$ Amp.

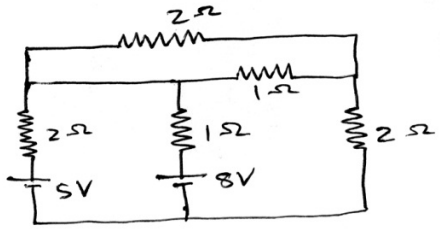
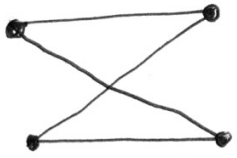


Q8 **a)** Write short note any two **(10)**
(i) Tellegen theorem (ii)Compensation theorem(iii) Band pass filter

b) Switch is closed t = 0 with network previously unenergised find $I_1(t)$ & $I_2(t)$ **(5)**



Q9 **a)** Verify the Tellegens Theorem for the given network. **(10)**
n=5



b) Find the number of trees and number of cutsets. **(5)**