



Reg. No. :

Name :

**Third Semester B.Tech. Degree Examination, November 2014
(2013 Scheme)**

13.303 : NETWORKS AND SYSTEMS (E)

Time : 3 Hours

Max. Marks : 100

PART – A



Answer **all** questions. **Each** question carries **2** marks.

1. Explain the term coupling coefficient.
2. Explain the Quarter wave symmetry with respect to non sinusoidal periodic wave forms.
3. State and explain initial value theorem.
4. Find the Laplace transform of the function $f(t) = e^{-at} \sin \omega t$.
5. Explain the term fundamental cut set.
6. Explain the terms
 - a) Cut off frequency
 - b) Pass band
 - c) Attenuation
7. Draw the T and π configuration of a low pass filter.
8. Explain the term image impedance.
9. Obtain the pulse response of a series RC circuit.
10. What is meant by driving point impedance ?

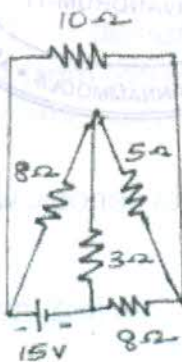


PART - B

Answer **one** question from **each** Module. **Each** question carries **20** marks.

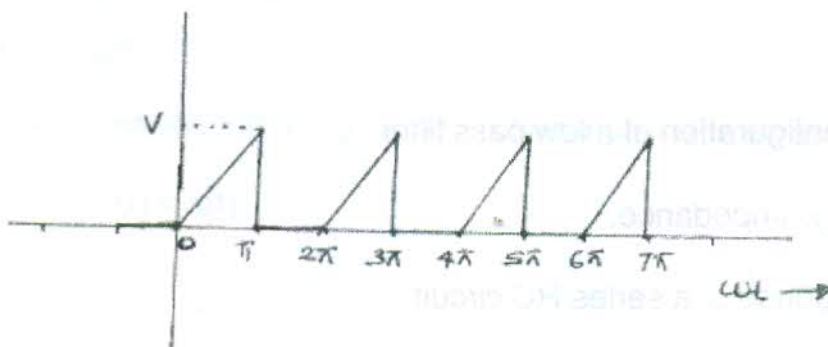
Module - 1

11. a) A star load with $Z_A = 10\angle 0^\circ \Omega$, $Z_B = 10\angle 60^\circ \Omega$ and $Z_C = 10\angle -60^\circ \Omega$ is connected to a 3ϕ , 3 wire 200 V ABC system. Find, the voltages across the load impedances V_{A_0} , V_{B_0} and V_{C_0} . 10
- b) Find the power loss in the 10Ω resistor using mesh analysis. 10



OR

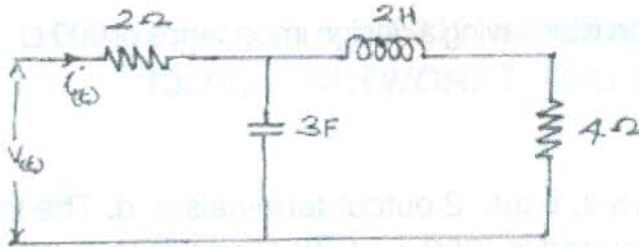
12. a) A delta load with $Z_{AB} = 10\angle 30^\circ \Omega$, $Z_{BC} = 25\angle 0^\circ \Omega$ and $Z_{CA} = 20\angle -30^\circ \Omega$ is connected to a 3ϕ , 3 wire 500 V system. If the phase sequence is ABC, find the line currents and total power. 10
- b) Find the trigonometric Fourier series of the wave form shown 10



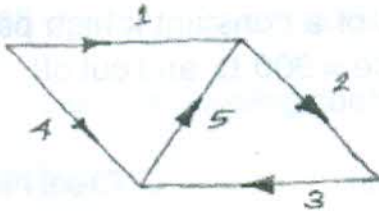


Module - 2

13. a) Determine the driving point impedance of the following circuit. 10



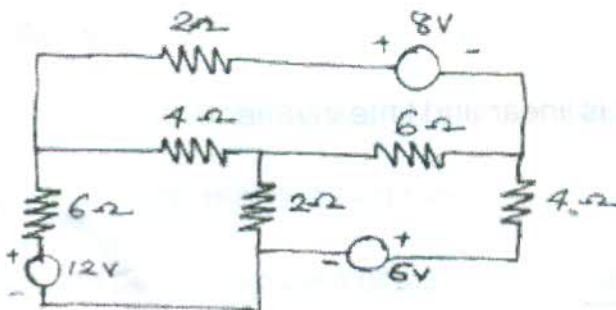
- b) Find the fundamental tie-set for the following graph 10



OR

14. a) The transform voltage $V(s)$ of a network is given by $V(s) = \frac{4s}{(s+2)(s^2+2s+2)}$. Plot its pole zero diagram and hence obtain $V(t)$. 10

- b) Draw the linear oriented graph of the network shown in the following figure and write the incidence matrix. 10





Module – 3

15. a) Find the g parameters in terms of
- ABCD parameters
 - Y parameters
- b) Design a low pass T and π section filter having a design impedance of 600Ω and cut off frequency 2000 Hz.

OR

16. a) A network has 2 input terminals a, b and 2 output terminals c, d. The input impedance with c, d open circuited is $(250 + j 100) \Omega$ and with c, d short circuited is $(400 + j 300) \Omega$. The impedance across c,d with a, b open circuited is 200Ω . Determine the equivalent T network parameters.
- b) Find the designed values of various elements of a constant k high pass filter from the following data. Design impedance = 900Ω and cut off frequency = 5 KHz.

Module – 4

17. a) Given $Z(s) = \frac{s^4 + 7s^2 + 9}{s(s^2 + 4)}$ realize LC network using caver forms I and II.
- b) Synthesize the given impedance function $Z(s) = \frac{(s + 2)(s + 4)}{(s + 1)(s + 5)}$ using foster forms I and II.

OR

18. a) Find whether the following systems are causal or non-causal
- $y(t) = x(t) + x(t - 1)$
 - $y(t) = x(t^3)$
- b) Verify whether the following system is linear and time invariant
- $$3 \frac{dy(t)}{dt} + 5y(t) = x(t)$$