

Code No: 124AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2017

NETWORK THEORY

(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 75

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

**PART- A****(25 Marks)**

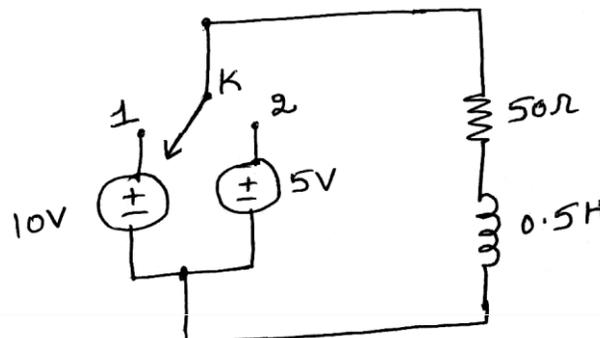
- 1.a) Define phase sequence. [2]
- b) List the advantages of three phase system over a single phase system. [3]
- c) Explain about Steady state or forced response [2]
- d) How do you interpretate time constant in transient analysis. [3]
- e) Why y-parameters are called as short circuit parameters? [2]
- f) Write the condition of reciprocity and symmetry interms of h-parameters. [3]
- g) How do you distinguish a Unbalanced and balanced symmetrical T- section. [2]
- h) How do you define Voltage and current transfer ratio? [3]
- i) What do you understand by complex frequency and its usage? [2]
- j) Explain the condition for even function symmetry. [3]

**PART-B****(50 Marks)**

- 2.a) How do you measure the active, reactive power and power factor of a balanced three phase load using two wattmeter method? [5+5]
- b) Derive the relationship between line and phase voltages and currents in a star connection. [5+5]

**OR**

3. A delta connected load has a parallel combination of resistance  $5\Omega$  and capacitive reactance  $-j5\Omega$  in each phase. If a balanced three phase 400V supply is applied between lines, find the phase currents and line currents and draw the phasor diagram. [10]
4. For the following figure 1, the switch is closed at position 1 at  $t=0$ . At  $t=0.5$  m Sec, the switch is moved to position 2. Find the expression for the current in both the condition and Sketch the transient current. [10]



5. Explain the transient response in time domain with constant DC excitation as input for a RC circuit. Draw the voltage waveform across R and C. [10]
- 6.a) List the necessary conditions for transfer functions.  
 b) Find the pole zero locations of the current transfer ratio  $I_2 / I_1$  in s- domain for circuit shown in figure 2. [5+5]

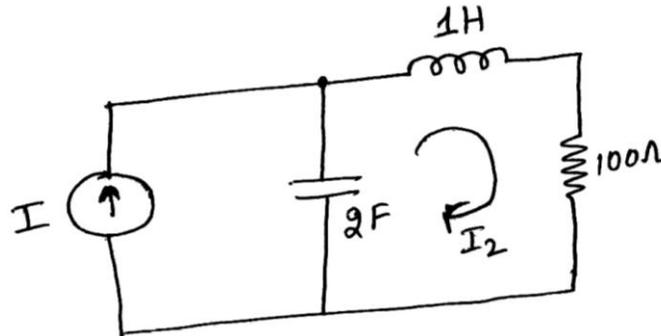


Figure: 2  
OR

7. For the network shown below figure 3, 'S' is switched on at  $t=0$ . Find the driving point impedance and the source current in s- domain. [10]

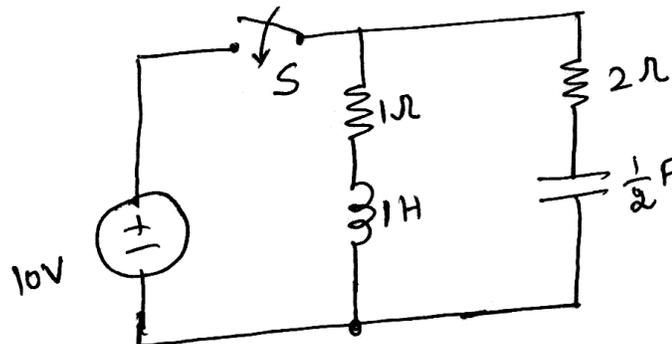


Figure: 3

- 8.a) Derive the condition for Reciprocity and symmetry in a two port Z - parameter representation.  
 b) The Z-parameters of a circuit are given by  
 $Z_{11} = 4; Z_{12} = 1; Z_{21} = 3; Z_{22} = 3$   
 Obtain the transmission parameters. [5+5]

OR

9. Determine the Z-parameters for the network shown in figure 4. [10]

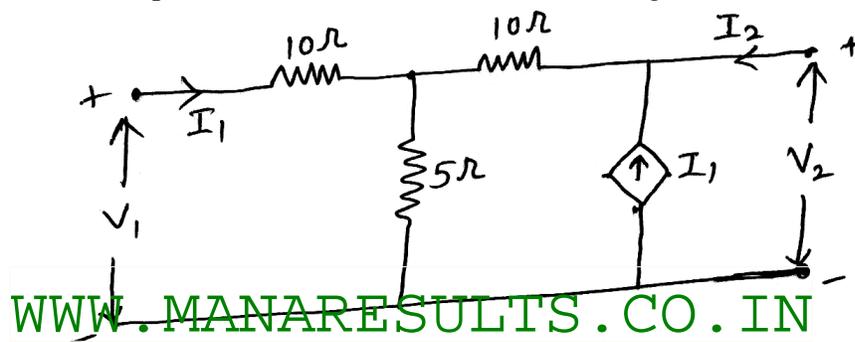


Figure: 4

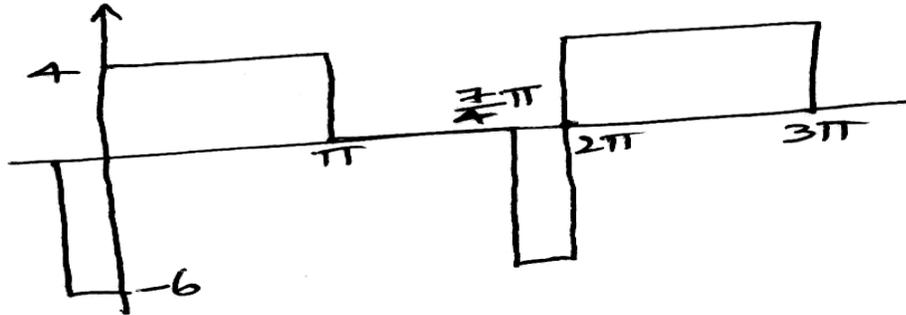
10.a) Explain in detail about the exponential form of a Fourier Series.

b) List the properties of Fourier transform.

[5+5]

**OR**

11.a) Find a and b coefficients of Fourier series for the following given waveform shown in figure 5.



**Figure: 5**

b) Explain the design procedure of constant 'K' high pass filter.

[6+4]