Code No: 133BK **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, November/December - 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) Give the advantages and disadvantages of tie-set matrix. [2]

b) Write the expression for total inductance of the three series connected coupled coils connected between A and B as shown in circuit shown in figure 1. [3]

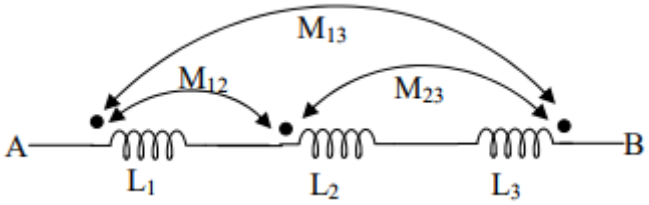

Figure: 1

c) What are the advantages of poly phase system over single phase system? [2]

d) Explain the effect of power factor on wattmeter readings in two wattmeter method. [3]

e) Explain why the current in inductance does not change in zero time. [2]

f) Write a short note on the procedure employed to evaluate initial conditions. [3]

g) Define active and passive ports. [2]

h) Express Z-parameters in terms of ABCD parameters. [3]

i) List out the disadvantages of constant – k filters. [2]

j) Sketch the frequency response of high pass filters. [3]

PART-B

(50 Marks)

2. Determine voltage V across a 15 ohms resistor in the magnetically coupled circuit shown in Figure 2. Take Vs = 30∠40 degrees. [10]

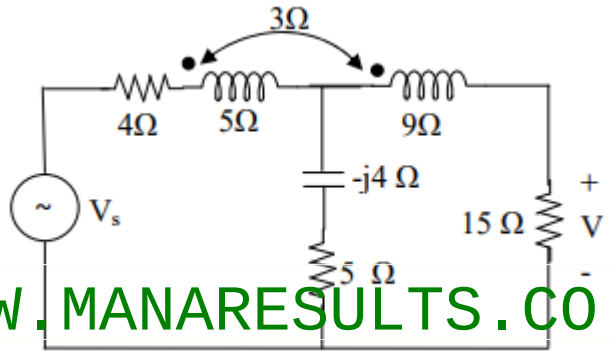

Figure: 2

OR

3. For the graph shown in Figure 3, write the incidence matrix. Express branch voltage in terms of node voltages and then write a loop matrix and express branch currents in terms of loop currents. [10]

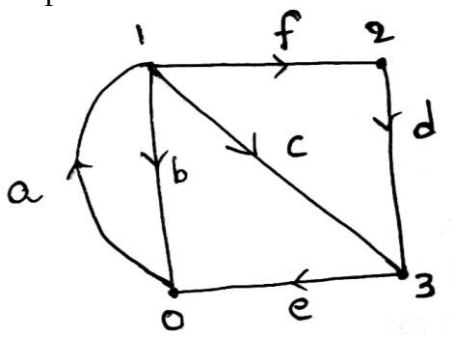

Figure: 3

4.a) Derive the relation between line and phase voltages and currents for a balanced STAR connected system.

b) The two watt meter readings in a 3-phase power measurement are 8 KW. The latter reading is being obtained after the reversal of current coil. Calculate the total power, Active Power, Reactive power and power factor of the load. [5+5]

OR

5. A three phase balanced delta connected load of (9+j2) ohm is connected across a 400V, 3ϕ balanced supply. Determine the phase currents and line currents. Assume the phase of sequence to be RYB. Also calculate the power drawn by load. [10]

6. With the switch open steady state is reached with V =100 sin 314 t volts. The switch is closed at t=0. The circuit is allowed to come to steady state again. Determine steady state current and complete solution of transient current (figure 4). [10]

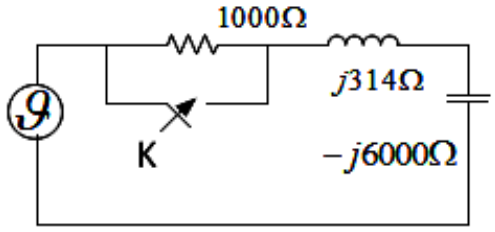

Figure: 4

OR

7. Obtain the expression for i(t) for a series RL circuit when exited by a source of V(t)=Vm sin (wt+θ) using Laplace transform. [10]

8. Find the Y-parameters for the circuit shown in figure 5. [10]

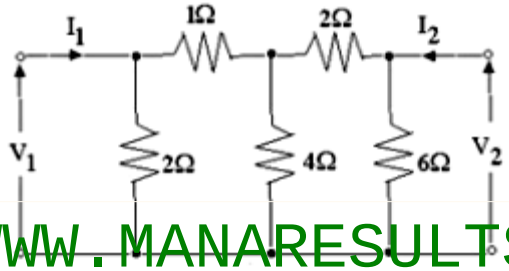

Figure: 5

OR

9. The Z-parameters of a two- port network are $Z_{11}=15\Omega$, $Z_{12}=Z_{21}=6\Omega$ and $Z_{22}=24\Omega$. Determine ABCD parameters. [10]

10. Design a band pass filter with cutoff frequencies of 2000Hz and 5000Hz with a design impedance of 500 ohms. [10]

OR

11. Design a m-derived low filter with a design impedance of 300Ω and the cut off frequency at 2 KHz and infinite attenuation at 2345Hz. [10]

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