PVP 20

Code: 20EC3304

II B.Tech - I Semester – Regular Examinations - FEBRUARY 2022

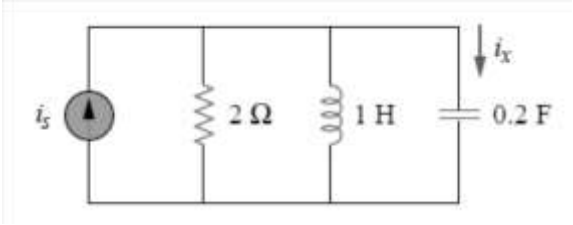
NETWORK THEORY AND ANALYSIS
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

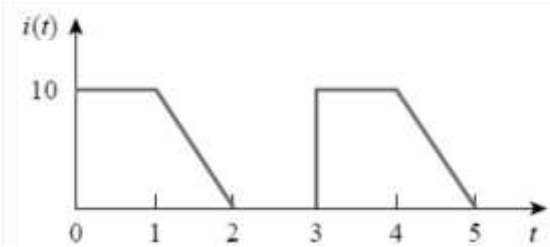
Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

UNIT – I

1. a) Find i_x when i_s = (2 sin 5t) A is supplied to the circuit. 7 M



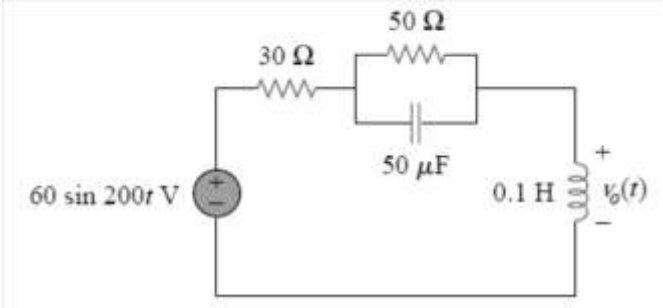
b) Determine the effective value of the periodic waveform shown in fig. 7 M



OR

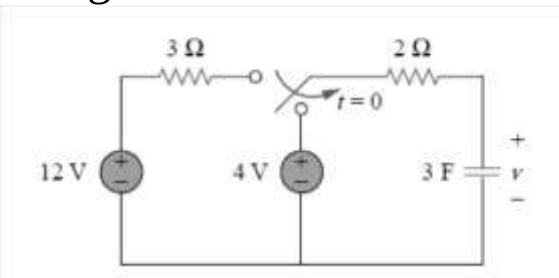
2. a) A relay coil is connected to a 210 V – 50 Hz supply. If it has a resistance of 30Ω and an inductance of 0.5 H. Calculate the apparent power and the power factor. 7 M

b) Calculate v_o in the circuit shown in fig. 7 M

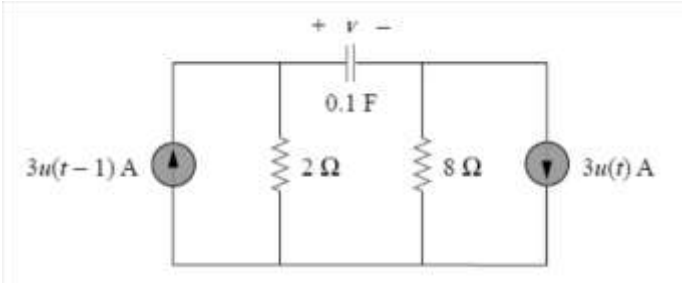


UNIT – II

3. a) Find the capacitor voltage for $t < 0$ and $t > 0$ for the circuit shown in fig. 7 M

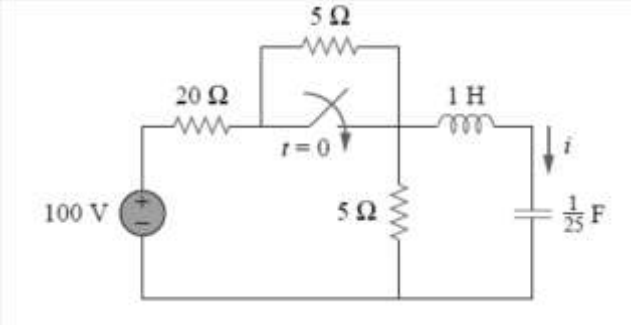


b) Determine v(t) for $t > 0$ in the circuit shown in fig. if $v(0) = 0$. 7 M

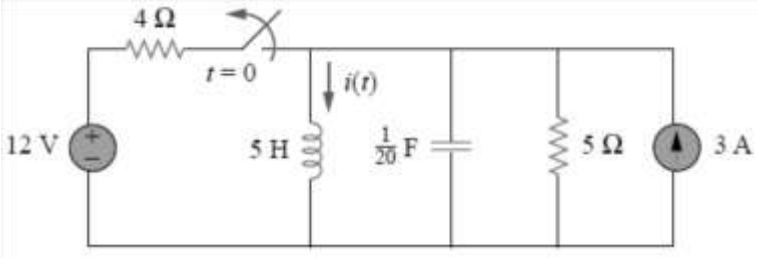


OR

4. a) For the network shown in fig. find i(t) for $t > 0$. 7 M

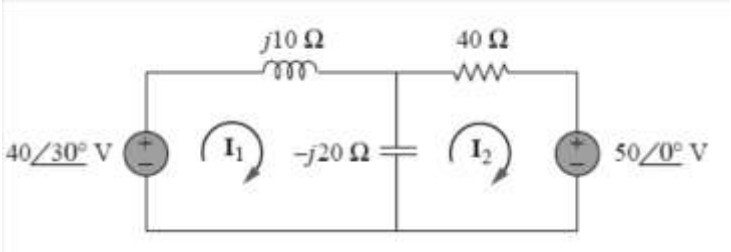


b) Determine i(t) for $t > 0$ in the circuit shown in fig. 7 M

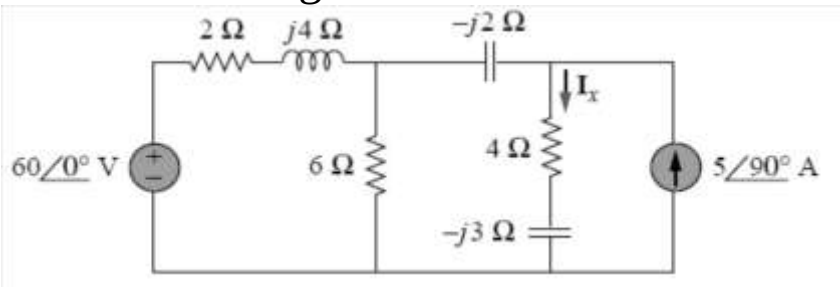


UNIT-III

5. a) Using Mesh analysis, find I_1 and I_2 in the circuit shown in fig. 7 M

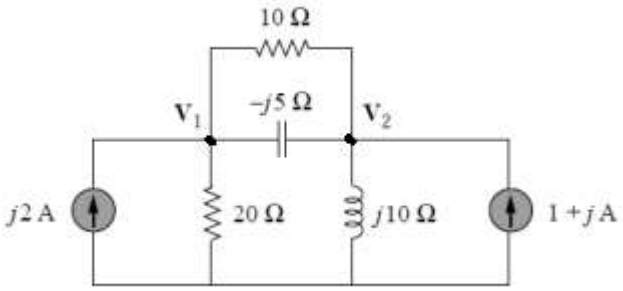


b) Use the method of source transformation to find I_x in the circuit shown in fig. 7 M

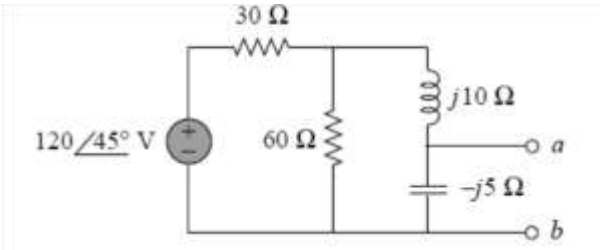


OR

6. a) Using Nodal analysis, find V_1 and V_2 in the circuit shown in fig. 7 M

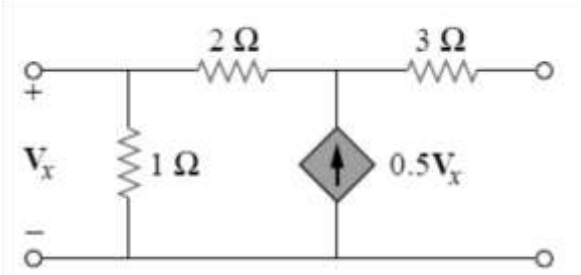


b) Obtain Norton's and Thevenin's equivalent circuit at terminals a-b . 7 M



UNIT – IV

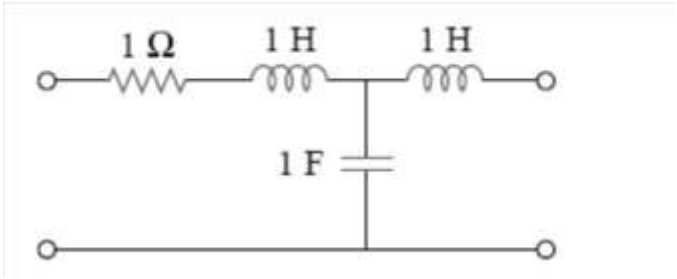
7. a) Determine the y parameters for the two port networks. 7 M



b) Derive and express the Z-parameters, Y-parameters in terms of ABCD parameters. 7 M

OR

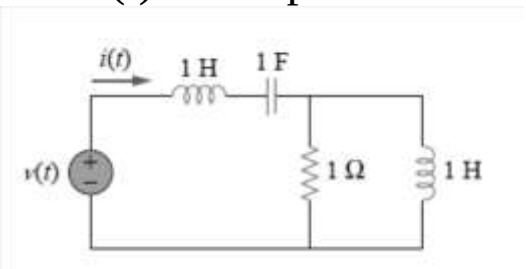
8. a) Find h-parameters and g-parameters for the two port network as a function of s. 7 M



b) Given that $[g] = \begin{bmatrix} 0.06S & -0.4 \\ 0.2 & 2\Omega \end{bmatrix}$ determine Z and T parameters. 7 M

UNIT – V

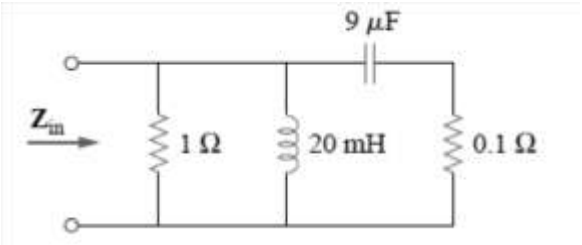
9. a) For the circuit shown in fig, find the frequency ω for which v(t) and i(t) are in phase. 7 M



b) A parallel resonant circuit with quality factor 120 has a resonant frequency 6 X 10^6 rad/sec. Calculate the bandwidth and half power frequencies. 7 M

OR

10. a) For the circuit shown in fig. find resonant frequency ω_0 and Z_{in} 7 M



b) Explain series and parallel resonance. What are their similarities and dissimilarities? 7 M