Code No: R21042 **R10** SET - 1

II B. Tech I Semester Supplementary Examinations, May/June - 2017
NETWORK ANALYSIS
(Com. to ECE, EIE, ECC)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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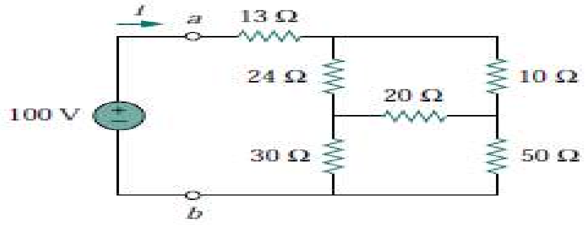
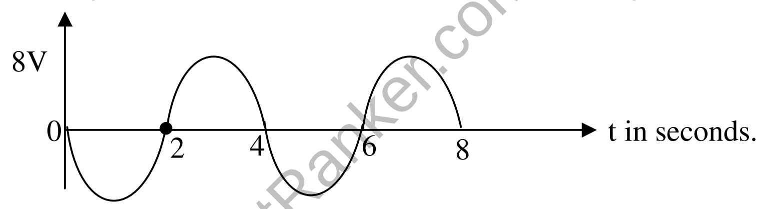
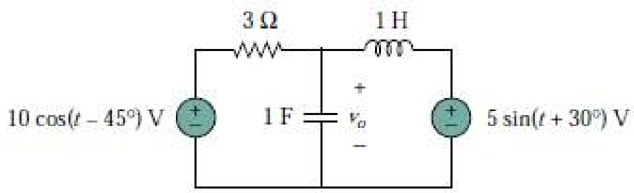
1. a) State and explain Kirchhoff's laws with a suitable example? (6M)
   b) For the network shown below find R_{ab} and i. (9M)



2. a) Explain the following terms with reference to a periodic function (6M)
   (i) Time period (ii) Frequency (iii) RMS value (iv) Average value (v) Form factor and (vi) peak factor
   b) Find the average value, rms value and form factor for the figure shown below. (9M)



3. a) A coil of inductance 159.2 mH and resistance 40 Ω is connected in parallel with a 30 μF capacitor across a 240 V, 50 Hz supply. Calculate (i) the current in the coil and its phase angle, (ii) the current in the capacitor and its phase angle, (iii) the supply current and its phase angle (iv) the power consumed (10M)
   (v) The apparent power, and the reactive power. Draw the phasor diagram.
   b) Find v_o in the circuit shown below using nodal analysis. (5M)



4. a) Explain the concept of series resonance and parallel resonance with an example? (8M)
   b) A series RLC circuit having an inductance of 0.4 H has an instantaneous voltage of V = 60 sin (4000t-Π/6) volts and an instantaneous current of i=2 sin 4000 t amps. Calculate the value of circuit resistance and capacitance and the frequency at which the circuit resonances. (7M)
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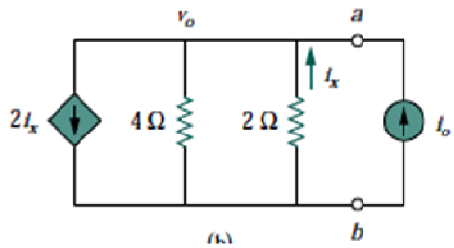
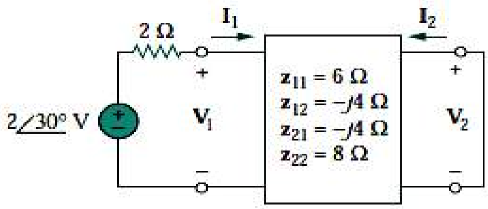
5. a) State and explain Thevenin's theorem with an example? (7M)

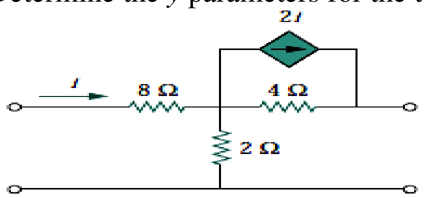
b) Determine the Thevenin's equivalent of the circuit shown below? (8M)



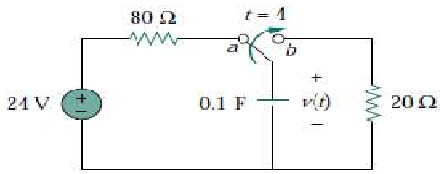
6. a) Calculate $\mathbf{I}_1$ and $\mathbf{I}_2$ in the two-port network shown. (8M)



b) Determine the *y* parameters for the two-port shown (7M)



7. a) The switch in Fig. shown has been in position '*a*' for a long time, until $t = 4$ s when it is moved to position '*b*' and left there. Determine $v(t)$ at $t = 10$ s. (8M)



b) Obtain the transient response of an RL series circuit with ac excitation. (7M)

8. a) Design an m-derived T and π sections low pass filters for nominal characteristic impedance $R_o = 600\Omega$, cut-off frequency = 1800 Hz and infinite attenuation frequency f_∞=2000 Hz. (8M)

b) Determine the range of frequencies that will be passed by a series RLC band pass filter with R = 10 Ω, L = 25 mH, and C = 0.4 μF. Find the quality factor (7M)