PVP 14

Code: EE3T4

II B.Tech - I Semester–Regular/Supplementary Examinations – November 2017

ELECTRICAL CIRCUIT ANALYSIS - II

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1. a) What is the condition for transfer of maximum power from source to load?
   b) State Tellegen's theorem.
   c) Write the relations for open circuit parameters.
   d) What is the driving point impedance?
   e) What are the hybrid parameters?
   f) State final value theorem.
   g) State the representation of Trigonometric form of Fourier series.
   h) Define the even function symmetry with examples.
   i) Define the time constant.
   j) A dc voltage is applied in RC circuit where R=10Ω and C=0.02μF. Find the time constant.
   k) What are the causes of occurring the transients in electrical circuits.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.
3 x 16 = 48 M

2. a) Using Superposition theorem, find the current through x-y branch in the circuit of figure 2(a). 8 M

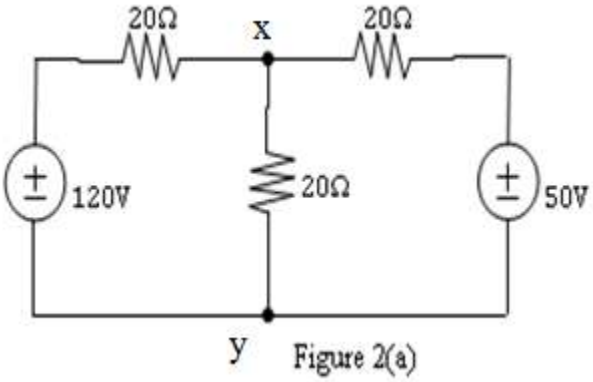

Figure 2(a)

b) Find the current flowing through 2Ω resistor in the circuit shown in figure 2(b) and verify the Reciprocity theorem.
8 M

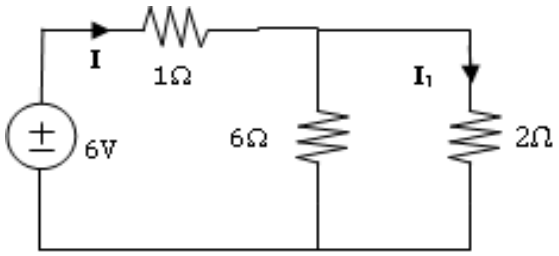

Figure 2(b)

3. Determine the Z-parameters and Y-parameters for the network shown below Figure 3. 16 M

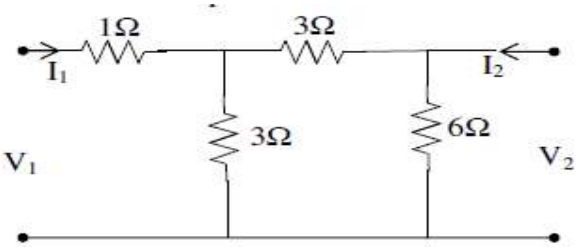

Figure 3

4. a) Find the expression i(t) of series RLC circuit with R= 5Ω, L= 1H, C= 1/4F, when it is fed by a ramp voltage of 12r(t-2). 8 M

b) A voltage v(t) = 1000 sin (314t) + 500 sin (942t + 90^0) is applied to a series combination of a resistance 100Ω and an inductor of 0.5H. Find the RMS value of v(t), i(t). Find the power delivered to the load and hence power factor. 8 M

5. a) Derive an expression for the decay current in an RC circuit excited by a unit step voltage. What is the time constant of the circuit? 8 M

b) For the circuit shown in Figure 5(b) find the expression for transient current when the switch is closed at t = 0. 8 M

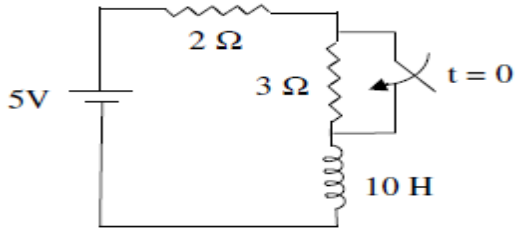

Figure 5(b)

6. a) A series RLC circuit, with R = 5Ω, L= 0.1H, and C = 500μF, has a sinusoidal voltage source, *v*(t)=1000 sin 250t. Derive the expression for current and the resulting current if the switch is closed at t=0. 8 M

b) A sinusoidal voltage of 12 sin 8t volts is applied at t=0 to a series circuit of R=4Ω and L =1H. By Laplace transform method determine the circuit current i(t) for $t \geq 0$. Assume zero initial conditions. 8 M