

Higher Technology Institute
10th of Ramadan City
Mechanical Engineering Department (Mechatronics)

Subject: Principles of Electrical Engineering EE191 Group 61 Examiner: Dr. Moataz Elsherbini	Term 1st semester 2016/2017 Time : 90 min Total Marks : 40
Final Exam (Jan 2017)	

Answer the following questions:

Question (1): Draw the Thevenin's equivalent circuit across R_2 shown in Figure (1). What is the required value for R_2 to achieve maximum power transfer from the rest of the circuit across it and then, calculate the maximum power transfer to R_2 . **(12 marks)**

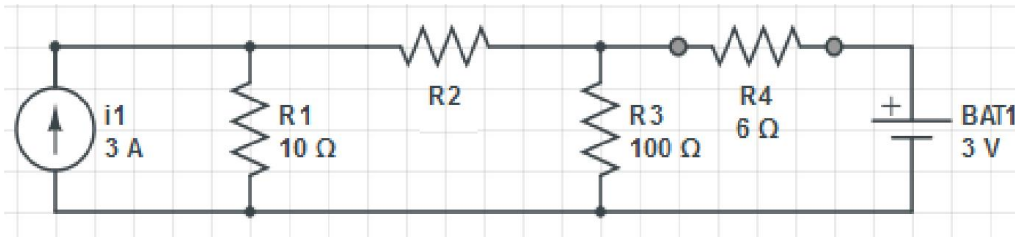


Figure (1)

Question (2): find v_x in the circuit of figure (2) using an appropriate method

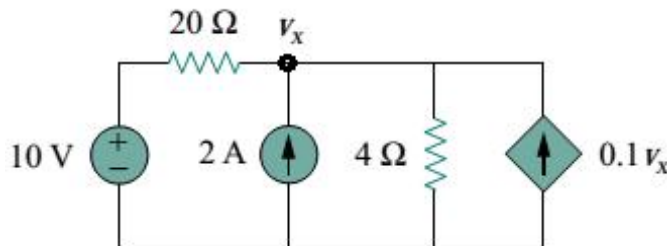


Figure (2)
(8 marks)

Question (3): A series R-L branch with $R_1 = 10\Omega$ & $X_L = 10\Omega$ connected in parallel with a series R-C branch, of $R_2 = 40\Omega$ & $X_C = 10\Omega$. The combination connected across a supply of 250V (rms) at 50Hz. Find the total impedance of the circuit and the total current (magnitude and phase). **(6 marks)**

Question (4): A series R-L circuit connected with AC supply voltage with peak of 100V and phase of 0° at frequency of 50Hz. If the magnitude of the inductive reactance was twice the value of resistance, Find the power factor. **(4 marks)**

Question (5): find the current pass through C_1 of figure (3) using two different circuit theory techniques **(10 marks)**

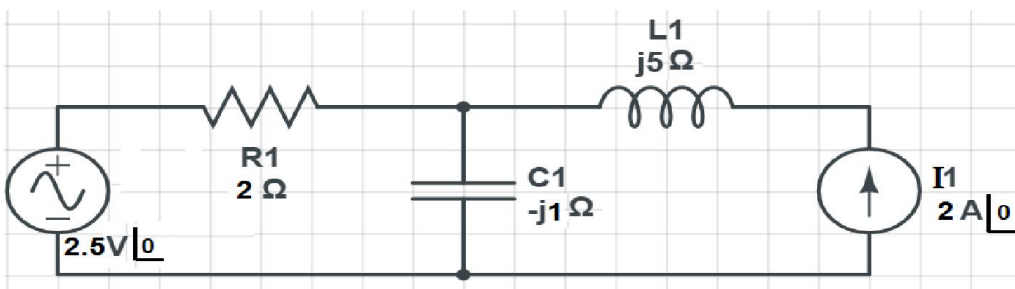


Figure (1)