

M.Sc. II (Electronics) (CBCS Pattern) Sem-III
PSELT301 - Paper-I - Core-IX : Network Analysis and Synthesis

P. Pages : 2

Time : Three Hours

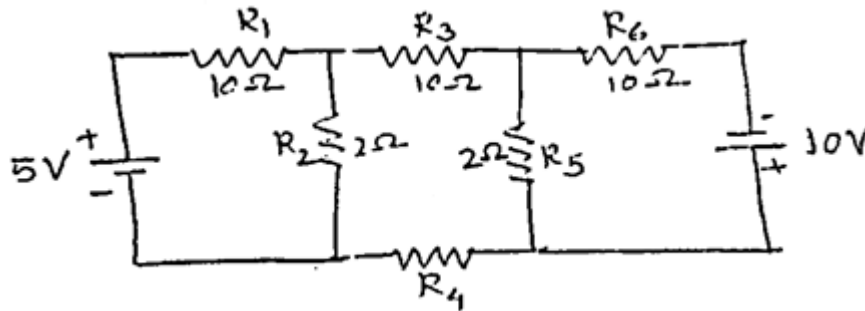


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Max. Marks : 80

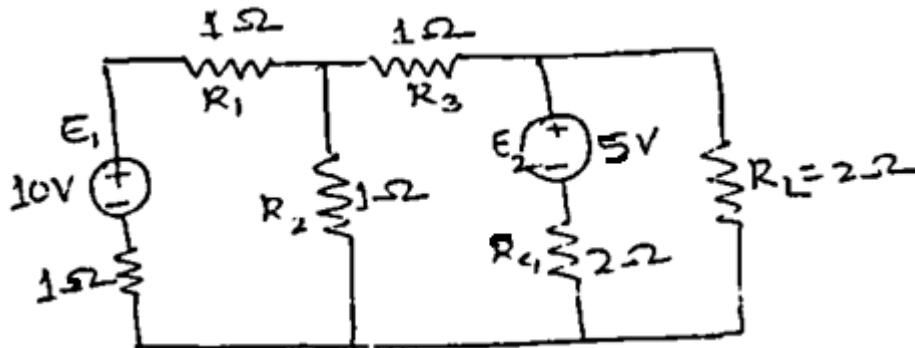
- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw neat and well labelled diagram wherever necessary.
 3. Use of calculator/log table is allowed.

1. a) What is mesh? Write the procedure for writing the mesh equation in matrix form. 8
- b) Find the voltage across R_5 , $R_4 = 10\Omega$ in the following network by mesh analysis. 8



OR

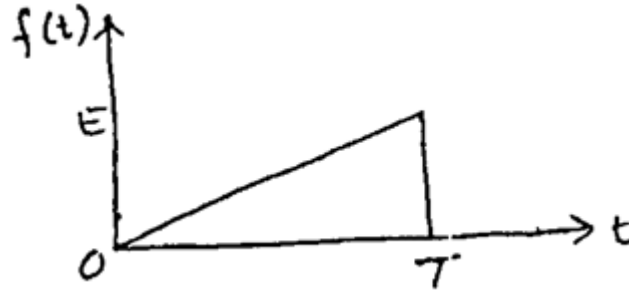
- c) Explain Supermesh analysis method with suitable example. 8
 - d) What is Source transformation? Explain the conversion method of voltage source to current source and vice versa with example. 8
2. a) State and prove superposition theorem. 8
 - b) Draw the Thevenin's equivalent circuit of the following network and find the current through R_L . 8



OR

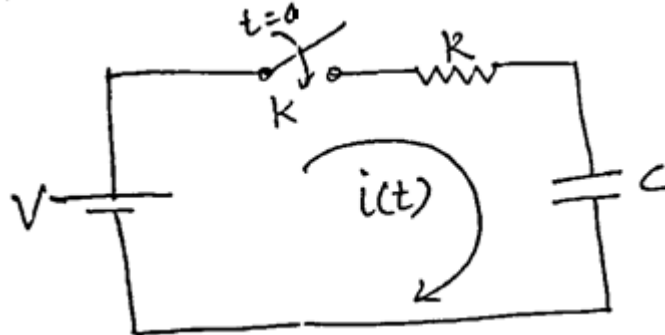
- c) State and prove reciprocity theorem. 8
- d) Explain the star and delta network and its transformation. 8

3. a) State and explain any two properties of Laplace transform. 8
- b) Determine the Laplace transform of Saw-tooth waveform shown in following figure. 8



OR

- c) State and prove Heaviside's expansion theorem. 8
- d) Consider a series R-C circuit shown in following circuit Switch K is closed at time $t = 0$. Find the current $i(t)$ using Laplace transform. 8



4. a) Describe time domain behaviour from pole zero plot. 8
- b) Describe Hurwitz polynomial with suitable example. 8

OR

- c) Determine the Foster first form and causer second form after synthesizing the RL driving-point impedance function. 8

$$z(s) = \frac{2(s+1)(s+3)}{(s+2)(s+4)}$$

- d) Discuss the necessary and sufficient conditions for the location of poles and zeros in driving point function. 8

5. a) State the advantages of mesh analysis. 4
- b) What is duality of network? Explain. 4
- c) Find the Laplace transform of exponential function $f(t) = e^{at}$. 4
- d) Discuss the one and two port network. 4
