



(Pages : 4)

J – 4696

Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, May 2020

(2013 Scheme)

13.303 : NETWORK ANALYSIS (AT)

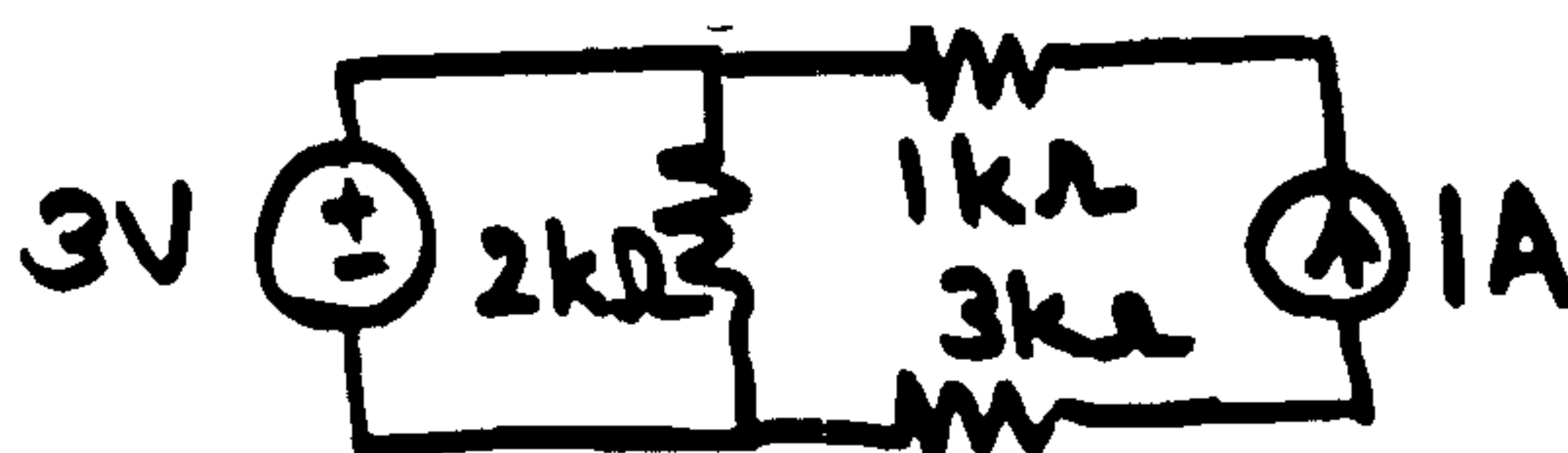
Time : 3 Hours

Max. Marks : 100

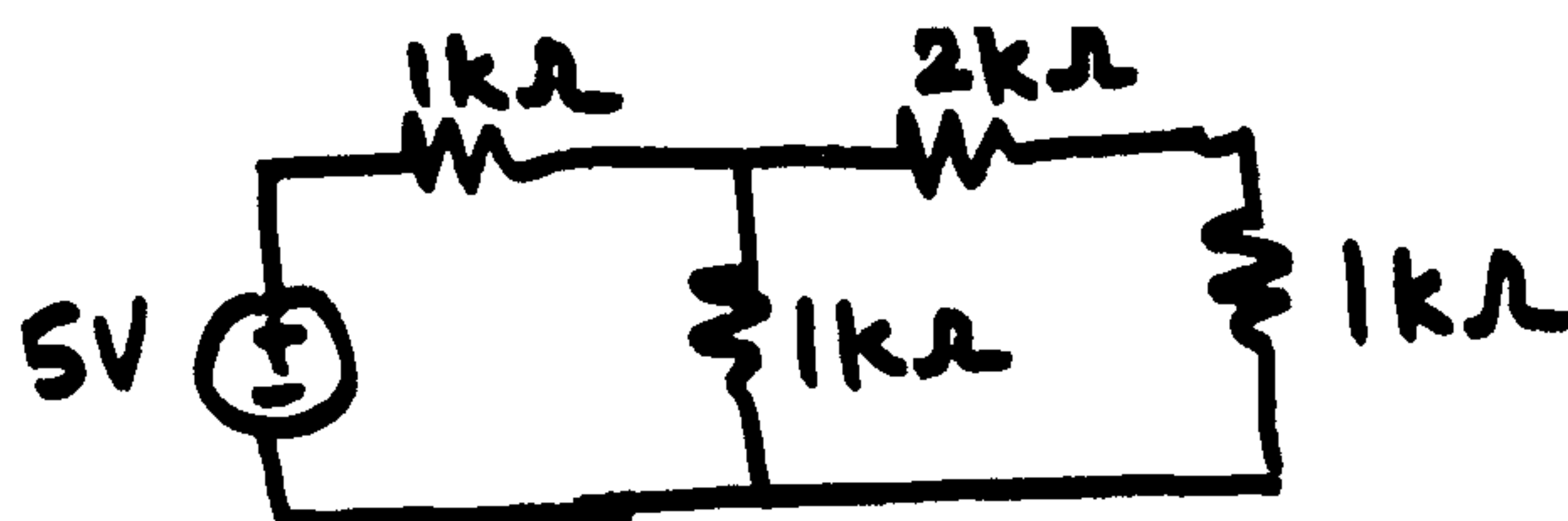
PART – A

Answer all questions. Each question carries 2 marks.

1. Find the current through the  $2k\Omega$  resistor.

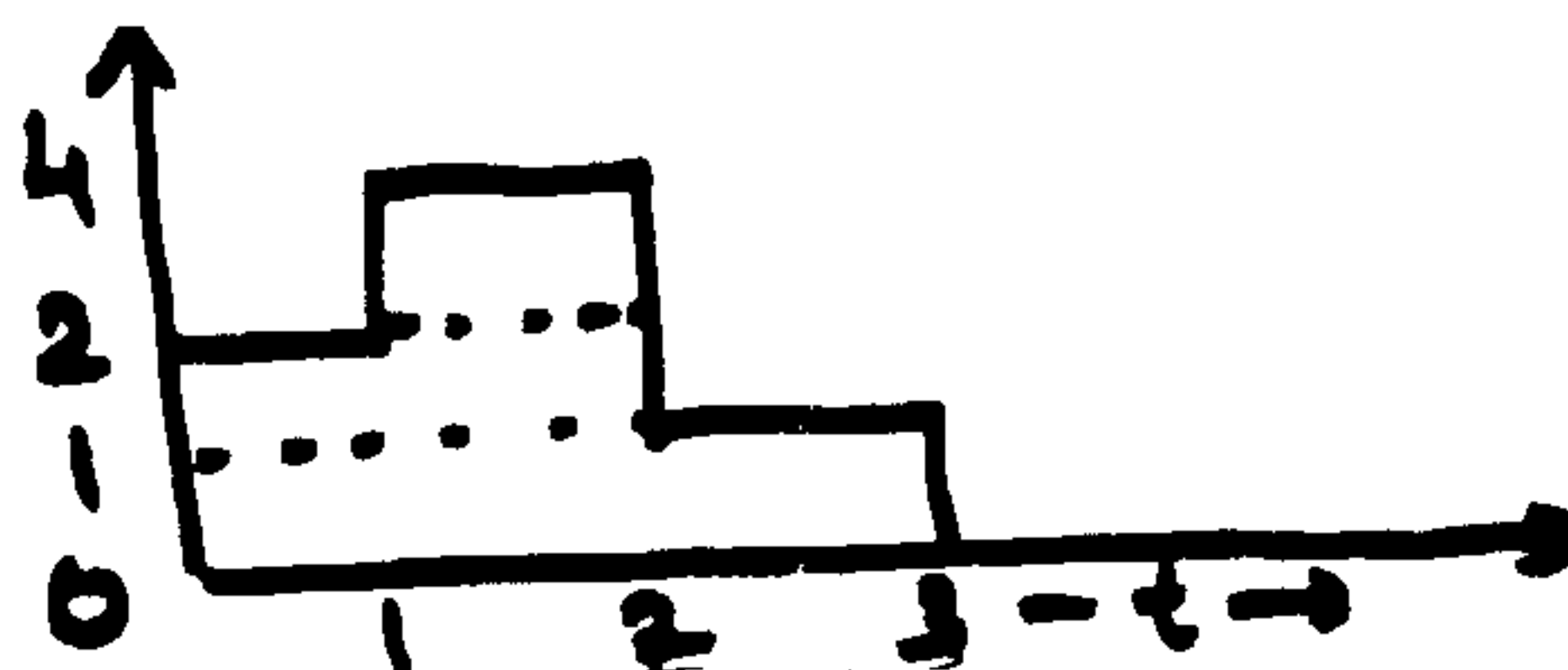


2. Design the Norton's equivalent of the circuit.



3. State and prove Reciprocity Theorem.

4. Express the waveform shown below using step functions.



P.T.O.



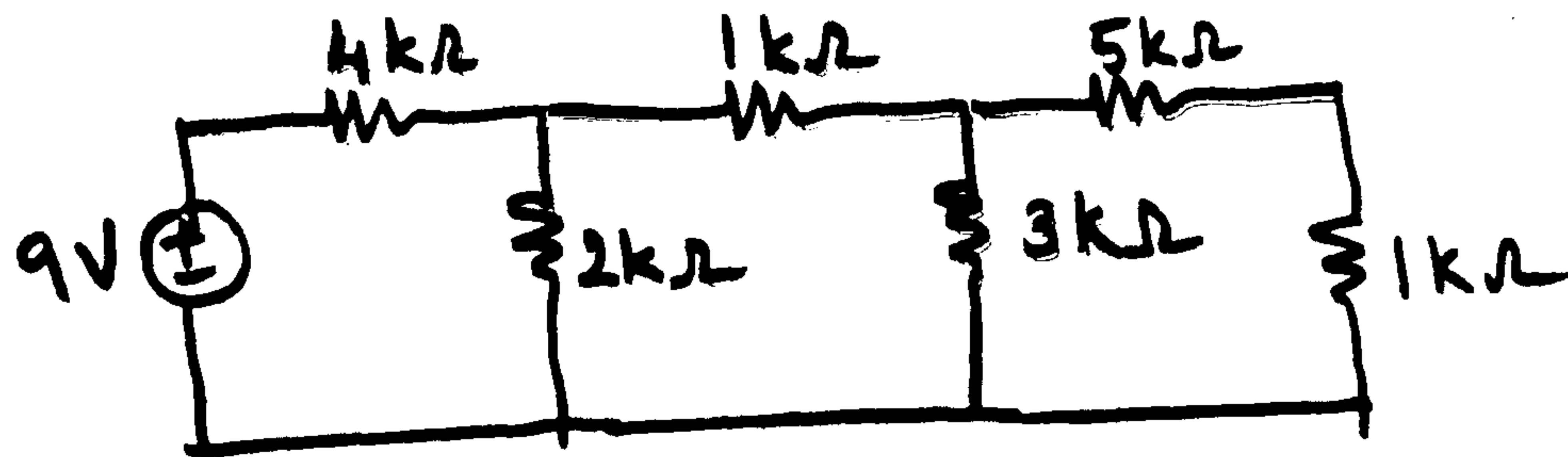
5. Differentiate between single tuned and double tuned circuit.
6. How is transmission parameters useful in defining a two-port network?
7. Give an overview of Cauer method for RC network synthesis.
8. What are the advantages in converting a Delta network to Star network?
9. State the significance of negative frequency.
10. Elaborate the importance of image impedance in network analysis.

PART – B

Answer **any one** questions from **each** Module.

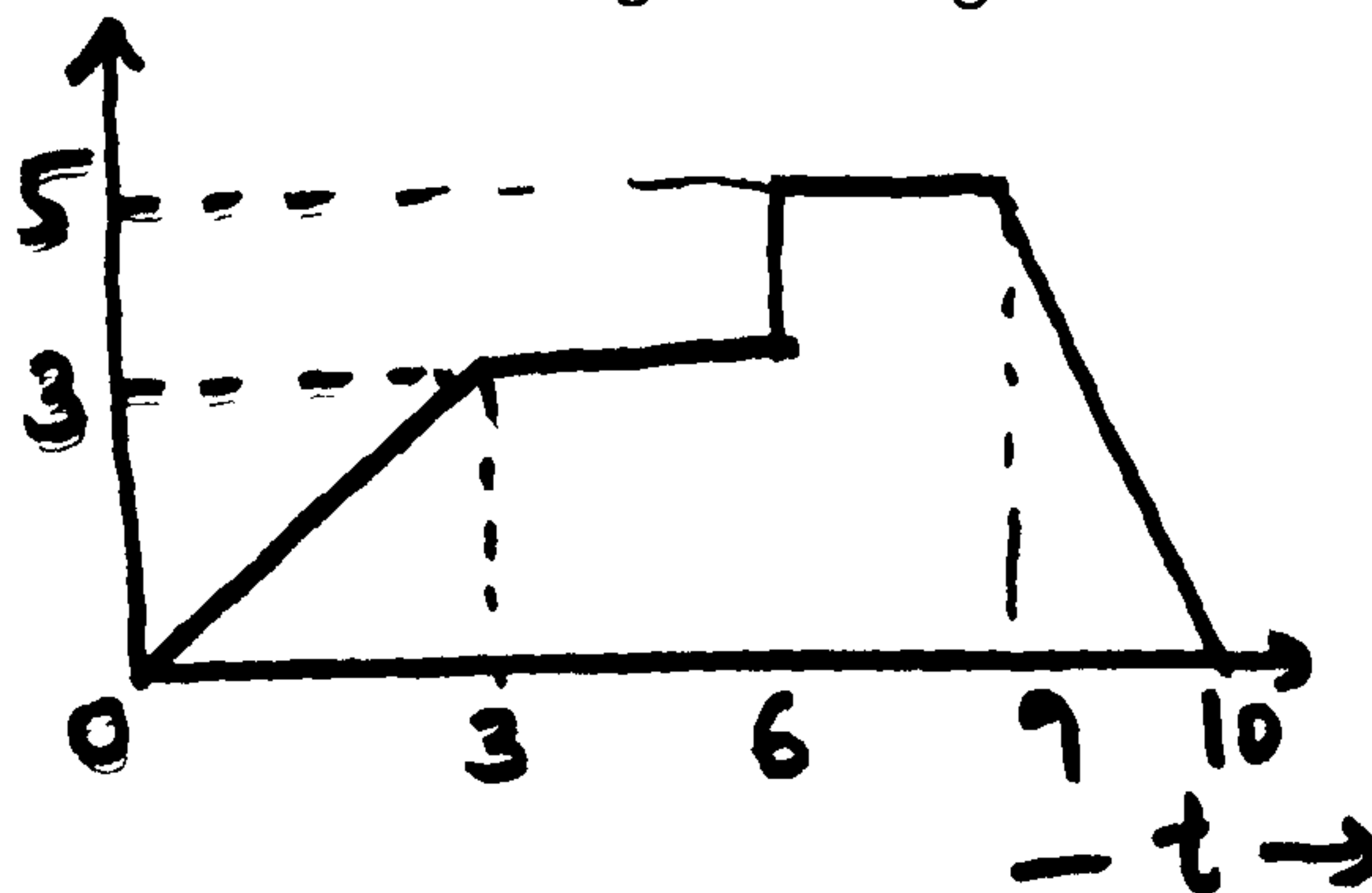
**Module – I**

11. (a) Using node analysis, find the current following through  $2K\Omega$  resistor. 10

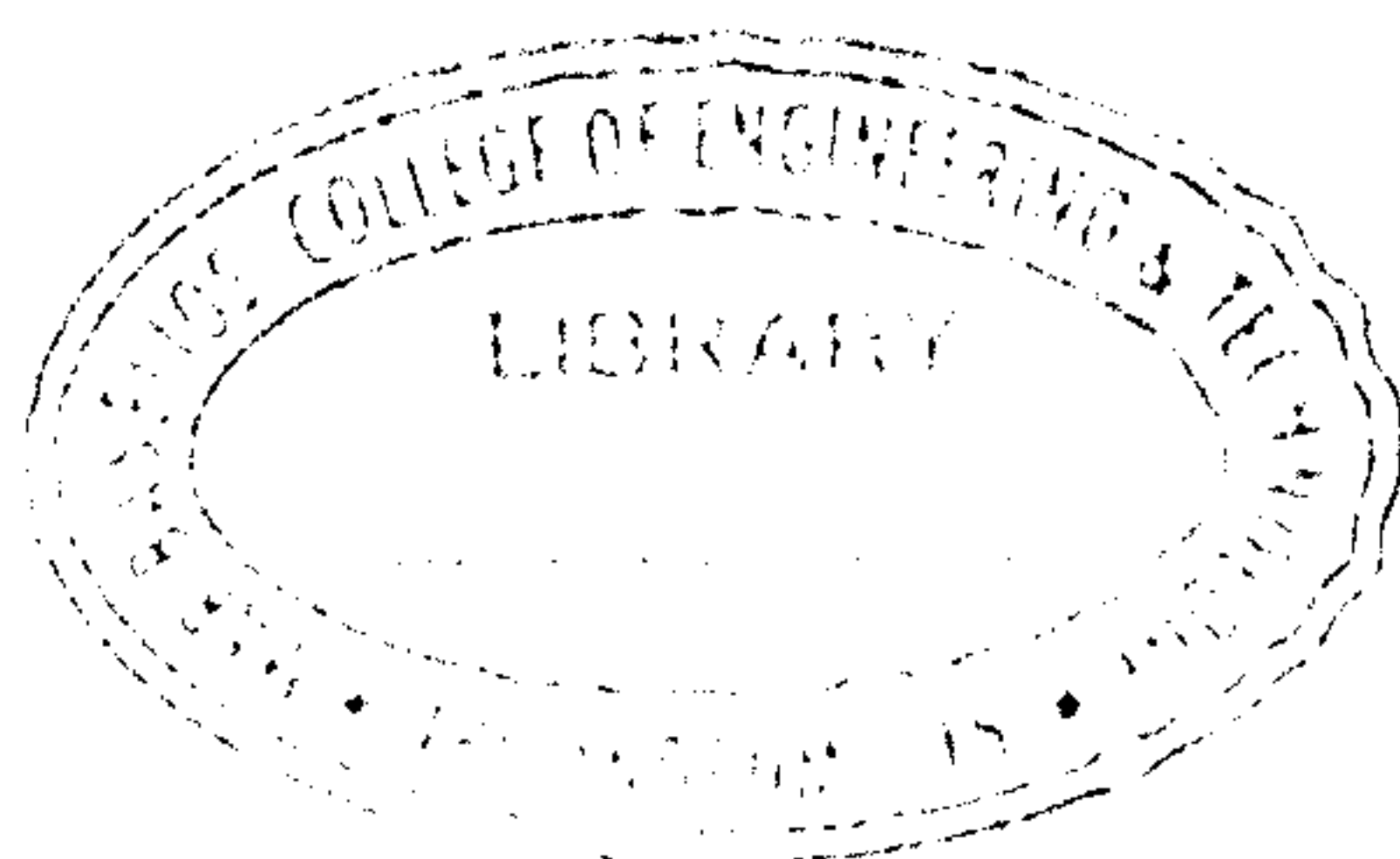


- (b) In the above problem, find the voltage drop across the  $4K\Omega$  resistor, if the voltage at input is doubled. 10

12. (a) Generate a function shown in figure using basic functions. 10

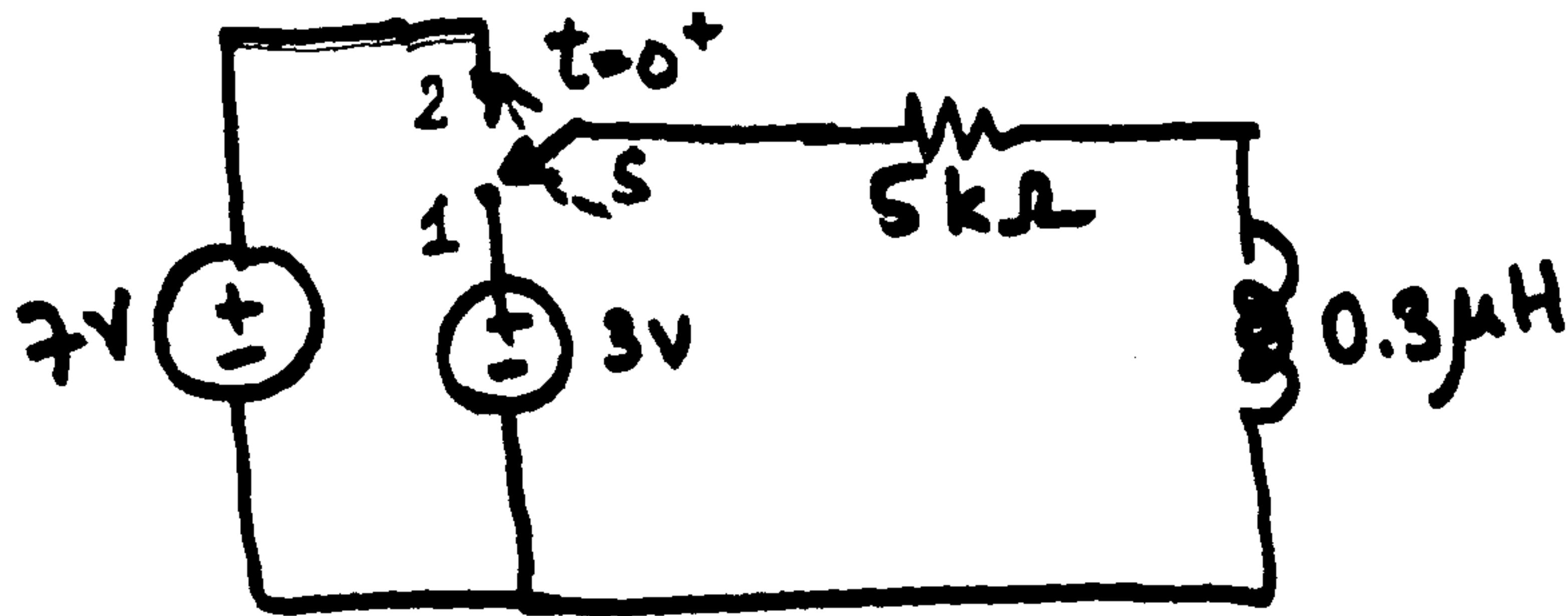


- (b) State and prove Superposition theorem. 10



**Module – II**

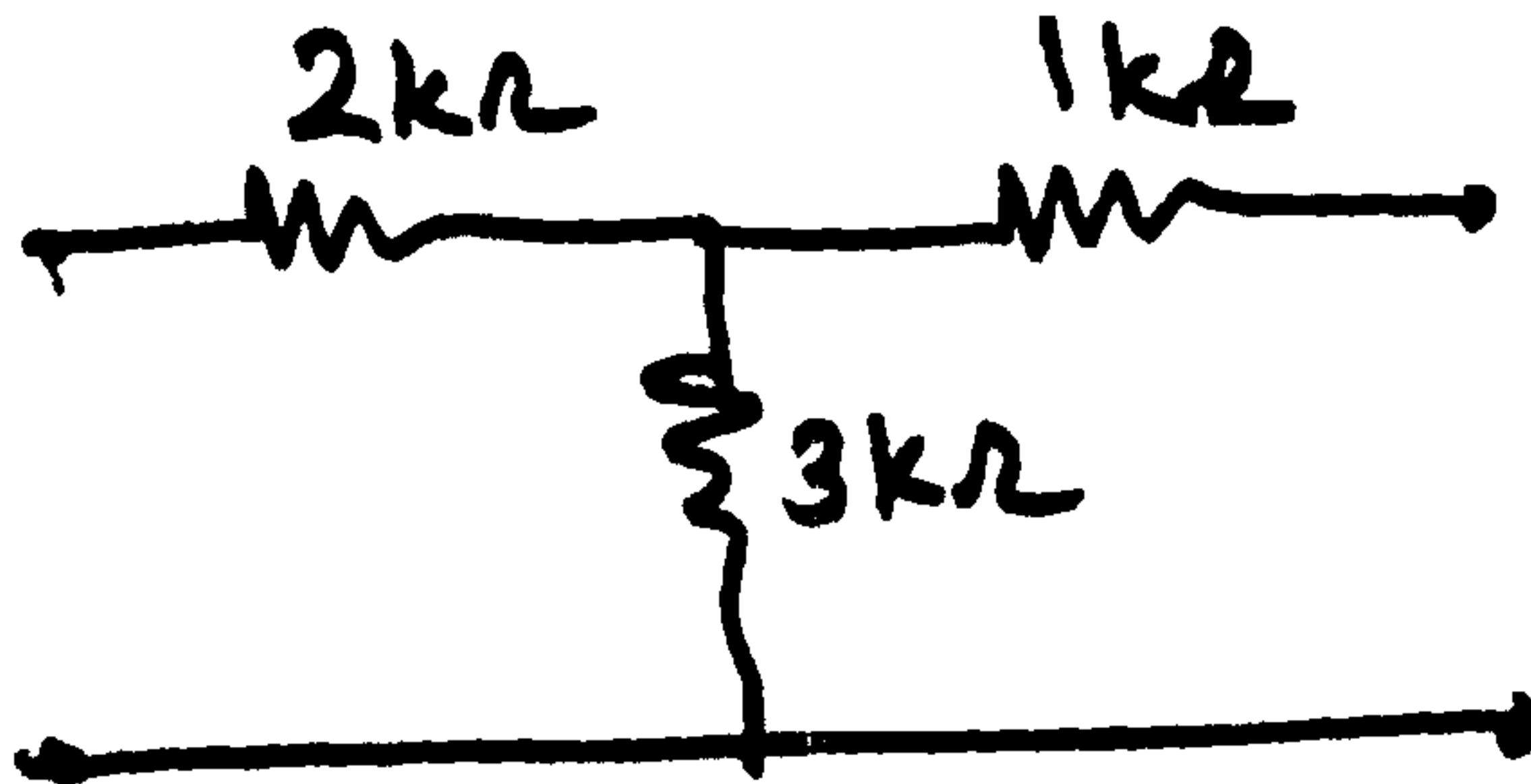
13. (a) An inductor has an initial current of 0.3A and is connected to a voltage of 3V. At  $t = 0^+$  the position of switch S is shifted instantaneously from 1 to 2, as shown in figure, find the current through the inductor at any time, t. 10



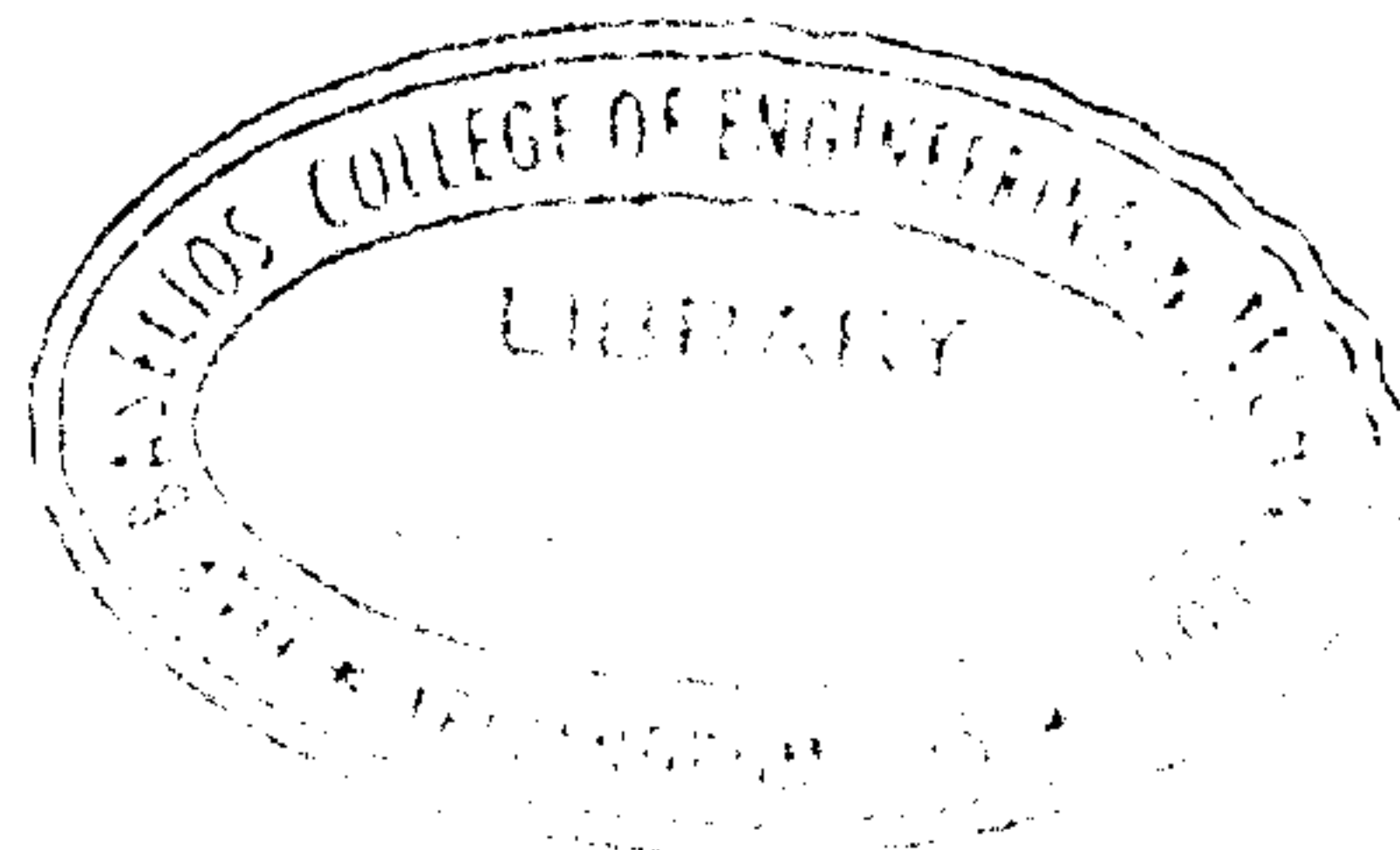
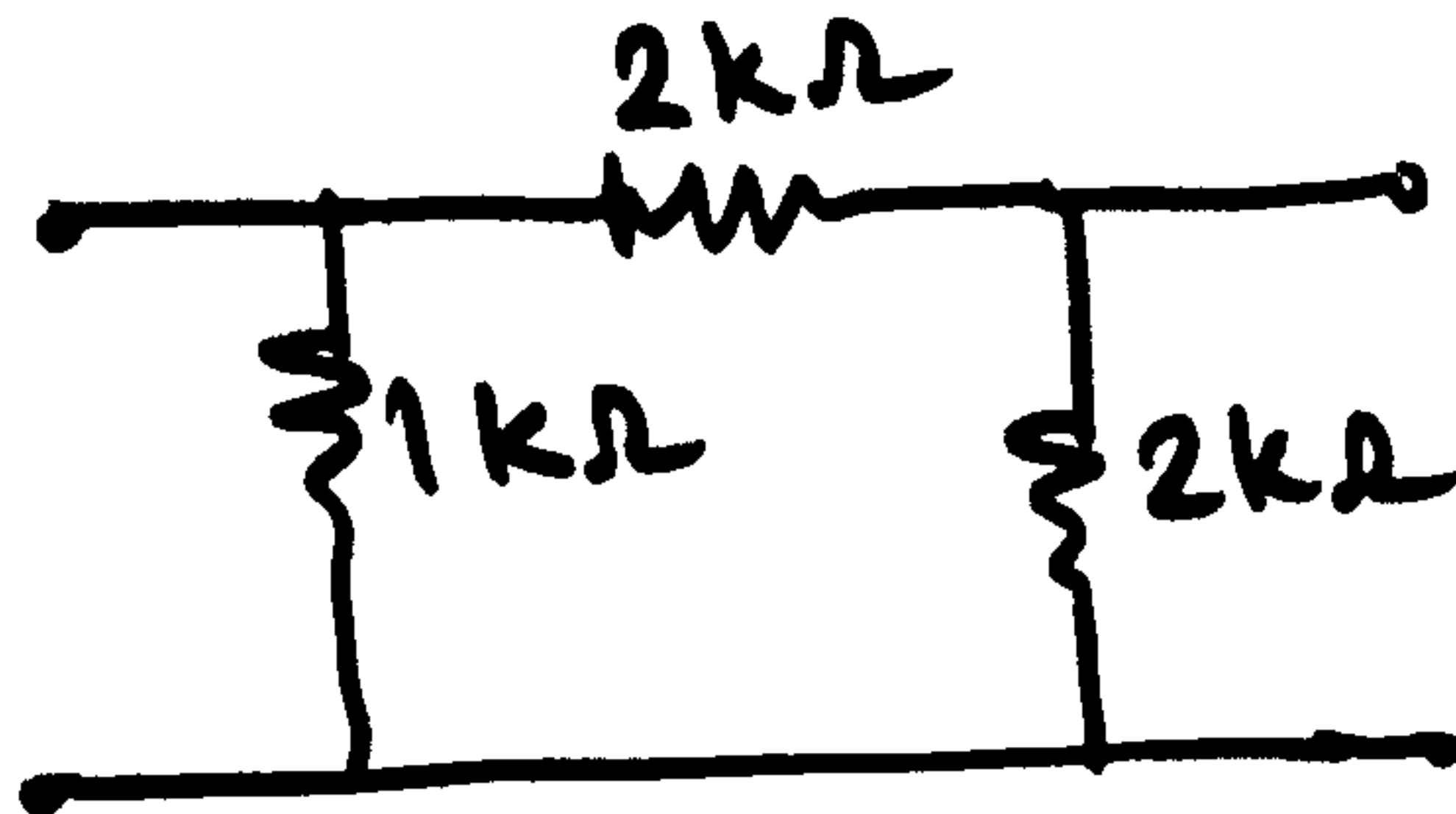
- (b) Derive the equation for current in an inductor at any time, t. 10
14. (a) Find the Inverse Laplace Transform of the system defined by 10
- $$H(S) = \frac{1}{(s+3)(s+5)}$$
- (b) What are the criteria for oscillation with respect to S-plane? When is a system said to be causal? Support the statements with equations. 10

**Module – III**

15. (a) Find the admittance matrix of the two-port network shown in figure. 10



- (b) Find the hybrid parameters of the network shown below. 10



16. Write short notes on:

- (a) Bandwidth
- (b) Dot-convention
- (c) Series resonance
- (d) Double tuned circuits

### Module – IV

17. (a) How is the stability of a system verified using Hurwitz polynomial. **10**
- (b) What are the differences between foster and cauer methods of synthesizing RC networks. **10**
18. A function is given by  $H(S) = \frac{(s^2 + 1)(s^2 + 9)}{s(s^2 + 16)}$ . Synthesize an RC network representing this function. **20**

