

國立台灣科技大學九十七學年度碩士班招生試題

所組別：電子工程系碩士班乙二組

目：電路學

總分共 100 分。作答時請標明題號。

1. (15%) Please determine the expression for the equivalent resistance R_{eq} for the circuit shown in Fig. P1. In addition, please plot the values of R_{eq} as a function of R_L where R_L is varied from 0 to infinity.

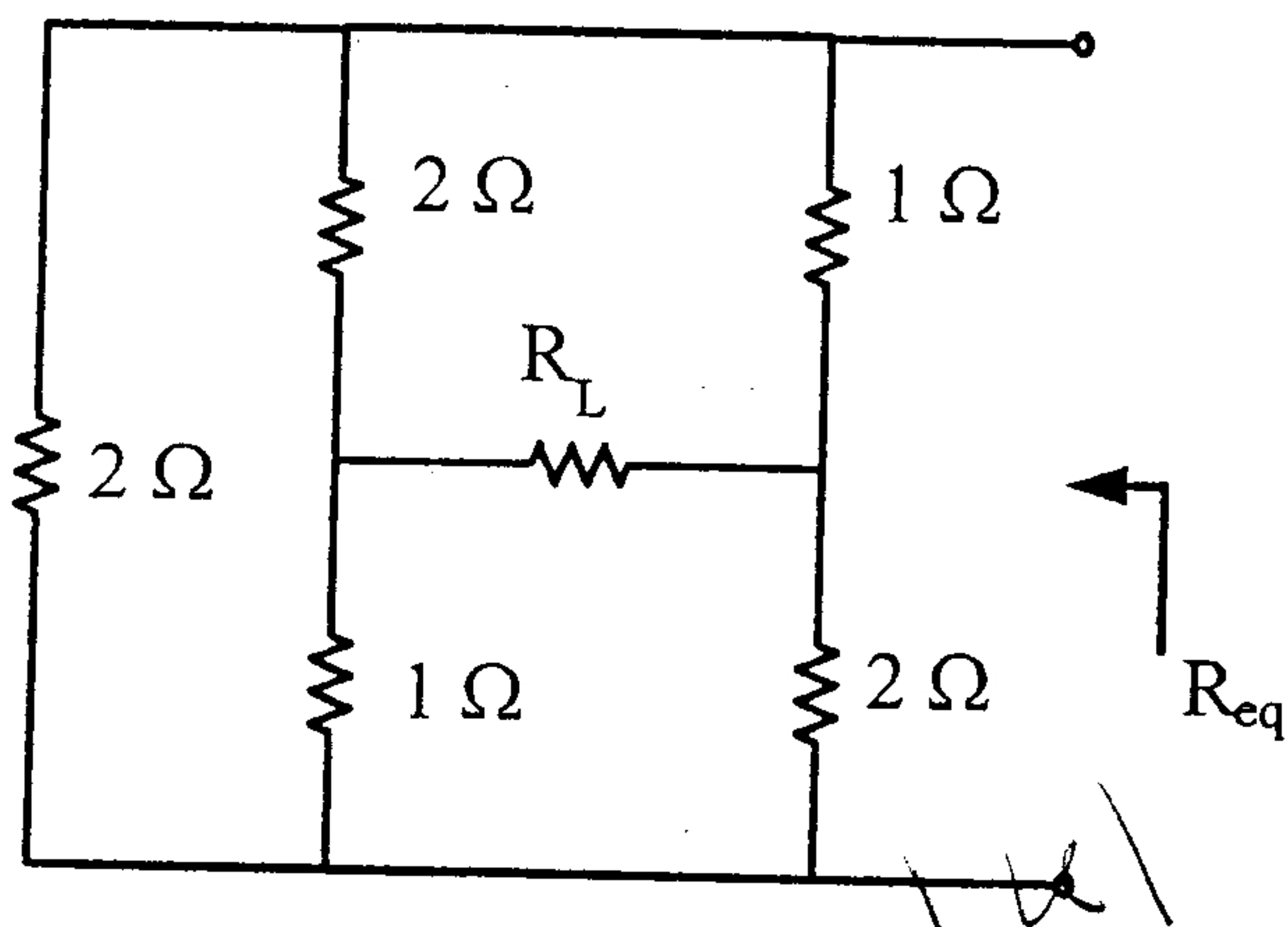


Fig. P1

2. (20%) Please consider the circuit shown in Fig. P2. The switch S is originally closed and the switch S is opened at $t=0$. Please find the voltage waveform $v(t)$ and the current waveform $i(t)$ for $t > 0$.

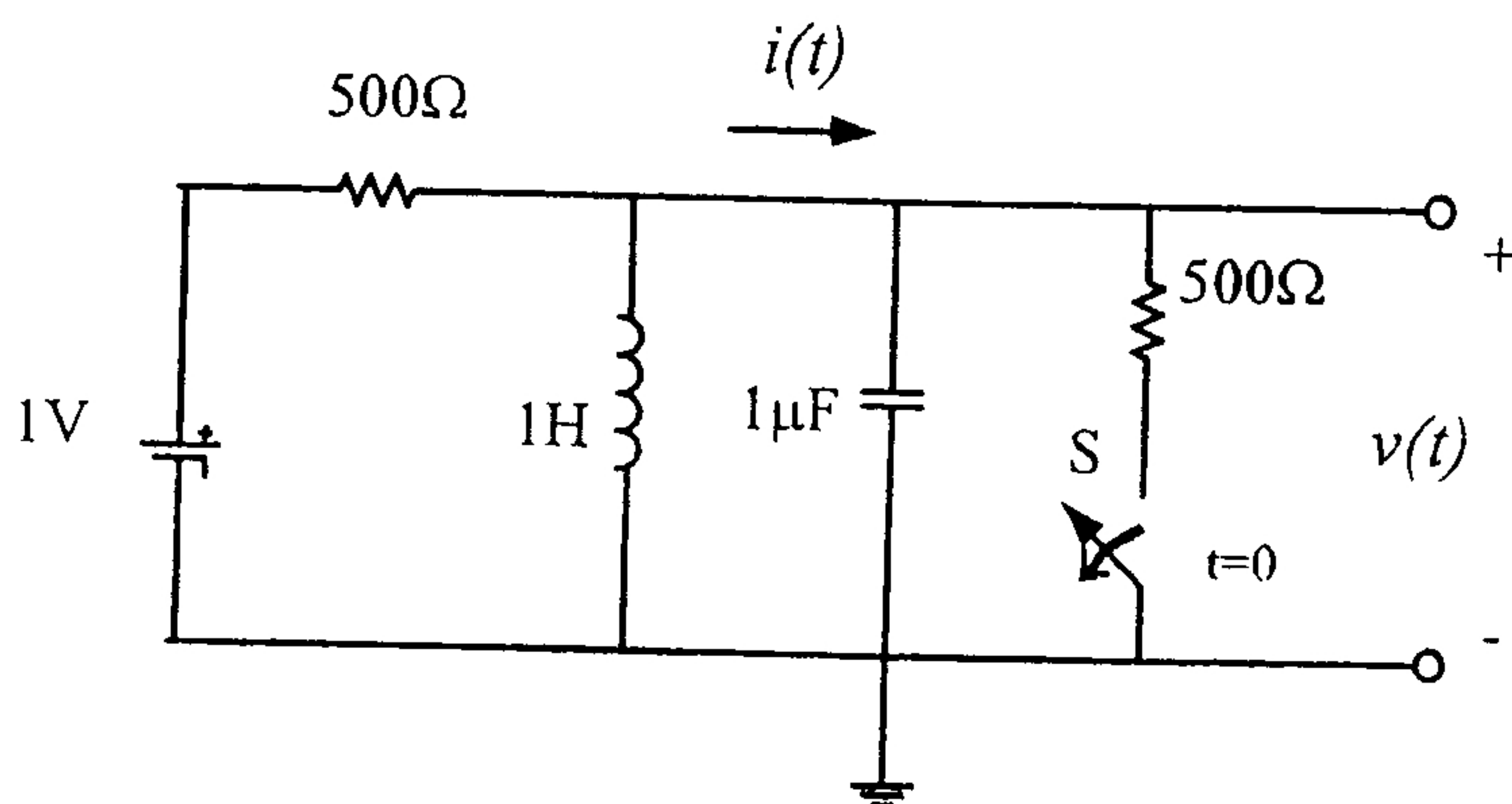


Fig. P2

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3. (15%) Please determine the Norton equivalent circuit of the circuit shown in Fig. P3, where $\beta = 0.002$ (Ampere/Volt).

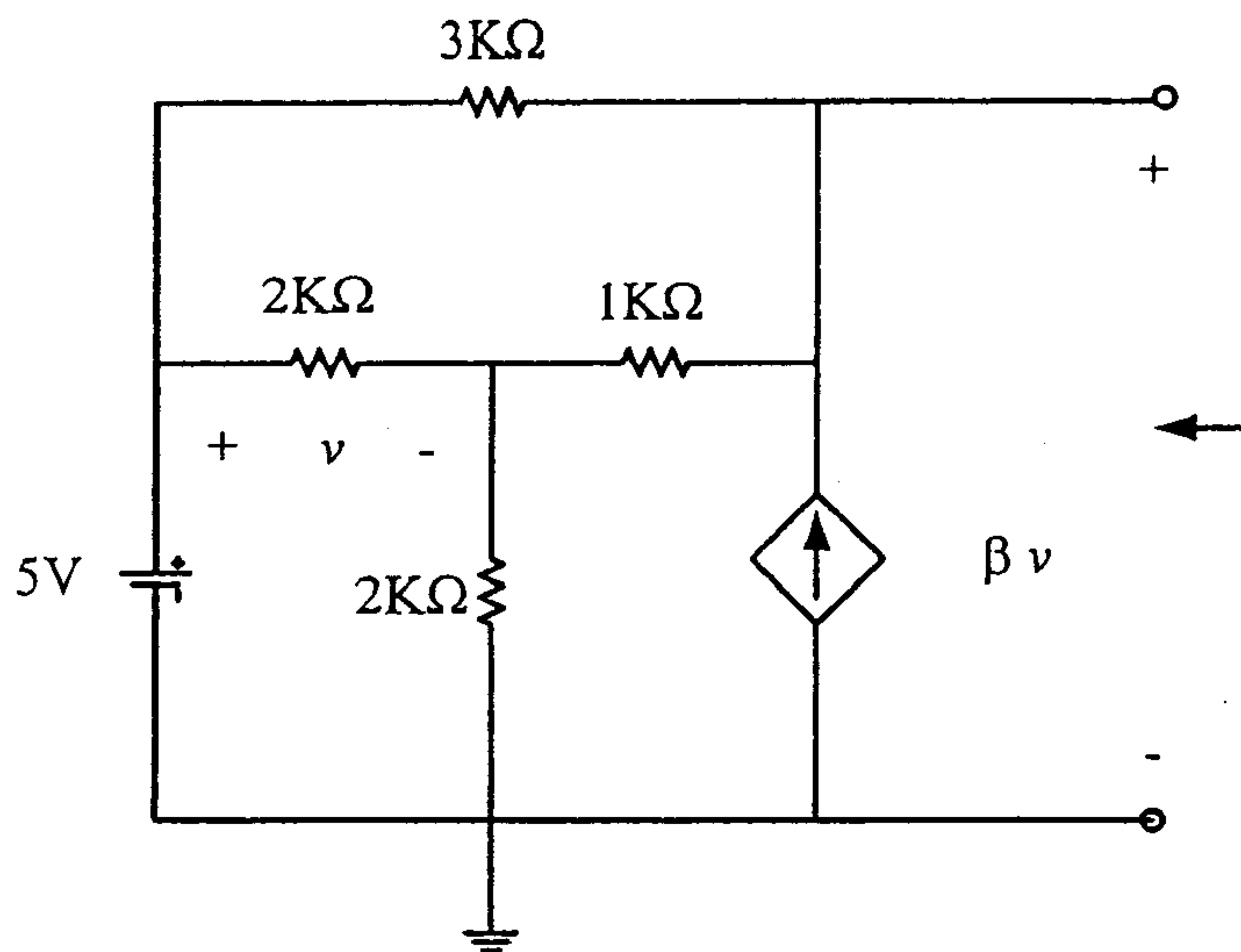


Fig. P3

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4. (15 %) Determine the value of R in the circuit shown in Fig. P4 such that the amplitude of i is 10 A.

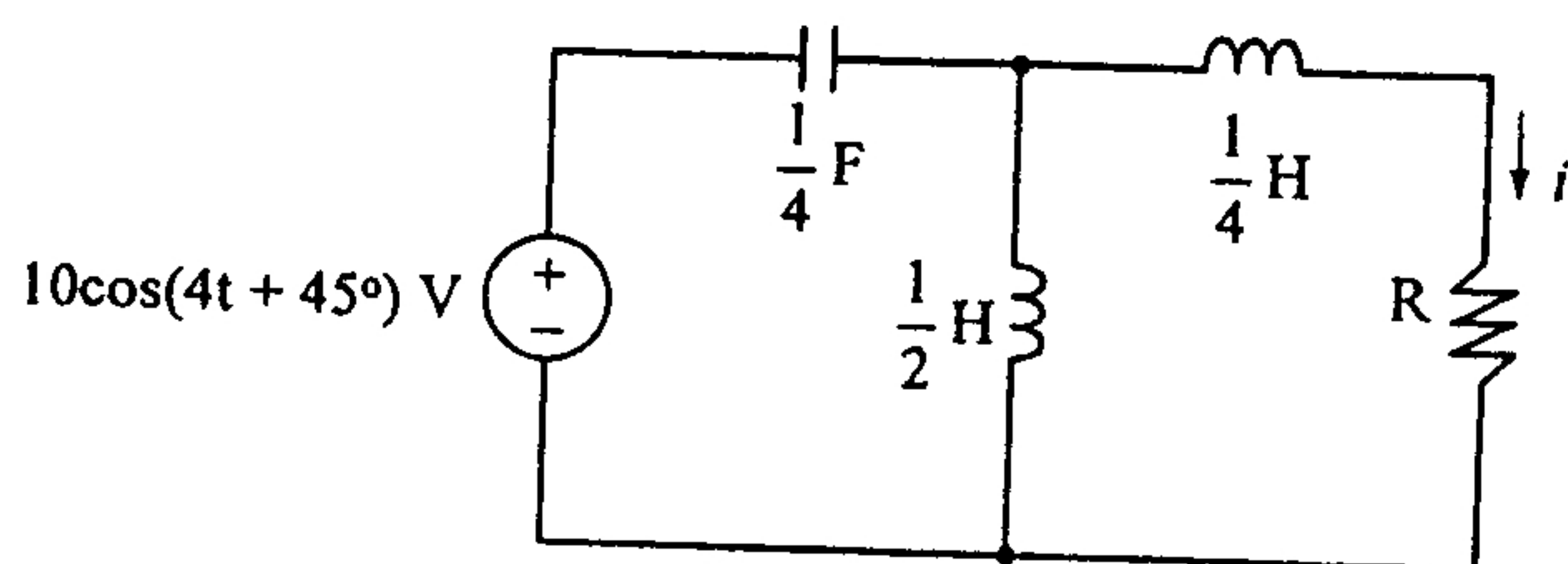


Fig. P4

5. (10 %) For the phasor circuit shown in Fig. P5, if Z_L is purely resistive, please determine the maximum power supplied from the source to Z_L .

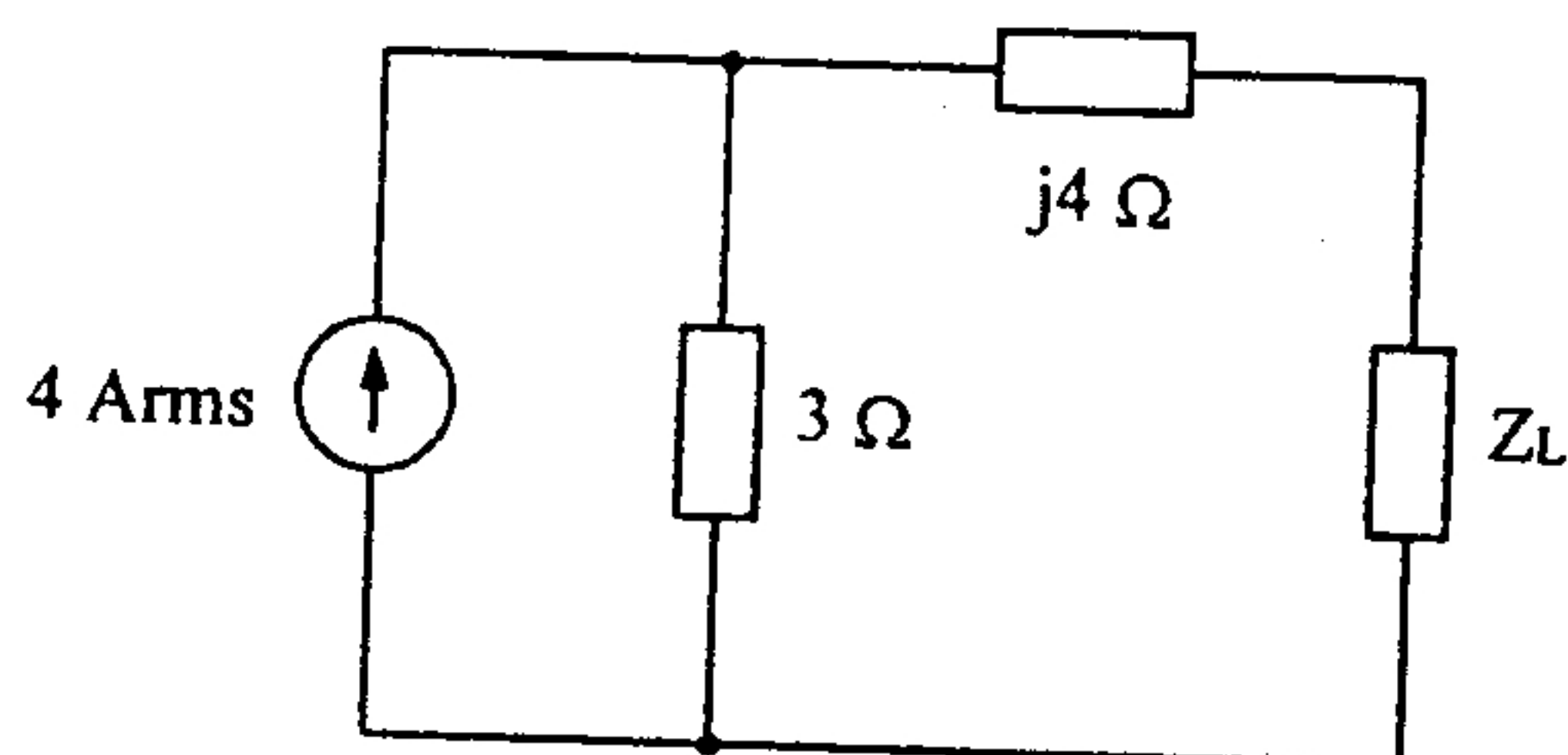


Fig. P5

6. (10 %) For the circuit shown in Fig. P6, where $u(t)$ is a unit step function, please determine $i_L(0^-)$, $v_C(0^-)$ and $v_C(t)$.

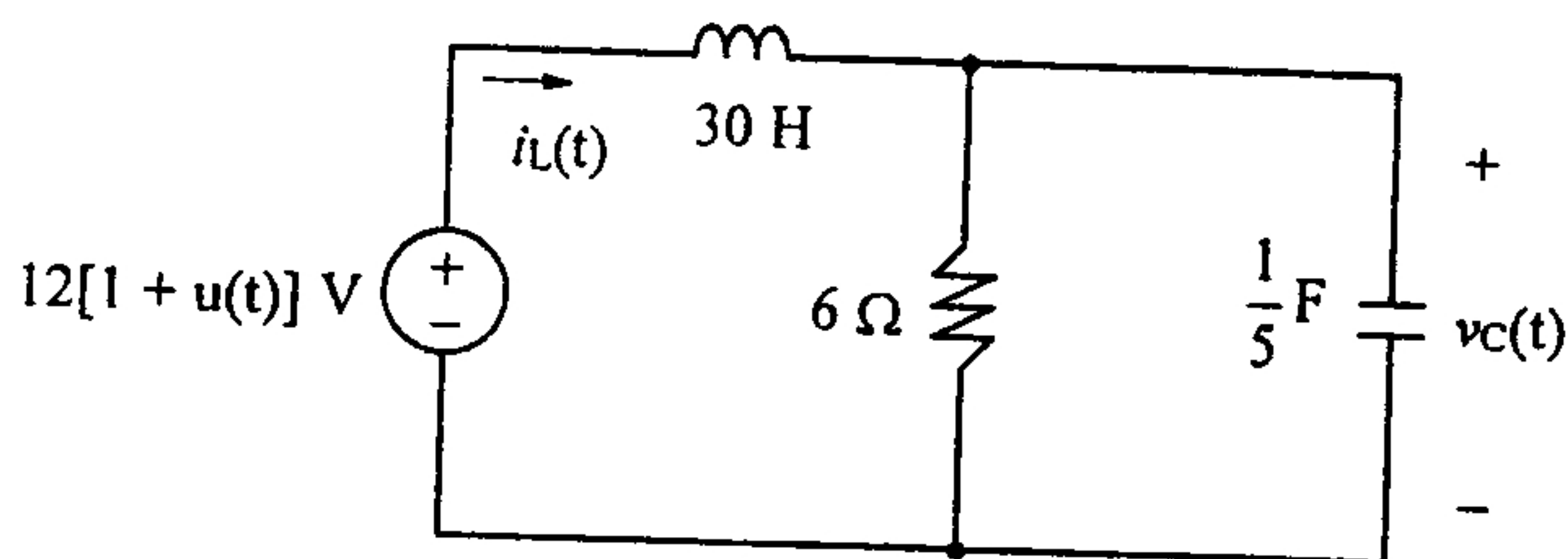


Fig. P6

7. (15 %) Determine the y-parameters of the two-port circuit shown in Fig. P7.

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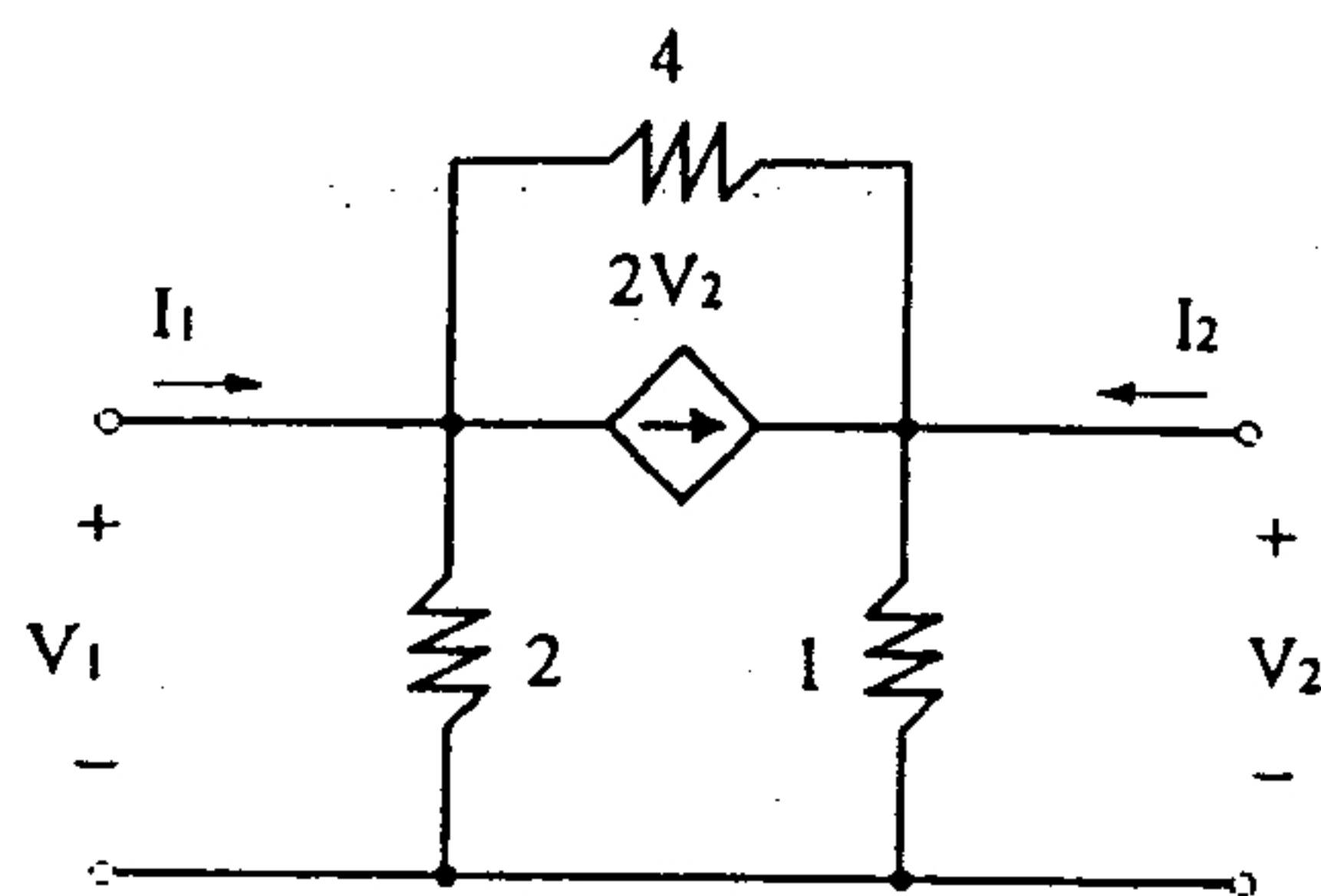


Fig. P7