

Note

1. Allowed Tools: Calculators
2. Leaving the classroom during the exam period will be considered as submitting the exam.
3. Every calculation process yields a score. (無計算過程不計分)
4. The answer ought to be presented in decimal format, not as a fraction.

Name : _____ SID : _____

6. Jun. 2024

1. (40%) Determine $f(t)$ from the given function $F(s)$.

(a) $F(s) = \frac{s+1}{s-1}$, (b) $F(s) = \frac{s-1}{s+1}$, (c) $F(s) = \frac{1}{s^2 + s + \frac{2}{3}}$, (d) $F(s) = \frac{s-2}{s^2 + 2s + 1}$.

2. (20%) For the network shown in Fig. 1.

- (a) Find the initial values $i_L(0+)$ and $v_c(0+)$.
- (b) Show the equivalent circuit in s-domain for $t > 0$.
- (a) Use Laplace Transform to determine $v_o(t)$ for $t > 0$.

3. (40%) For the network shown in Fig. 2.

- (a) Find the initial values $i_L(0+)$ and $v_c(0+)$.
- (b) Show the equivalent circuit in s-domain for $t > 0$.
- (c) Use Laplace Transform to determine $v_x(t)$ for $t > 0$.
- (d) Show the eigenvalues of $v_x(t)$ from (c).
- (e) Recalculate $v_x(t)$ for $t > 0$ using the eigenvalues and initial values.

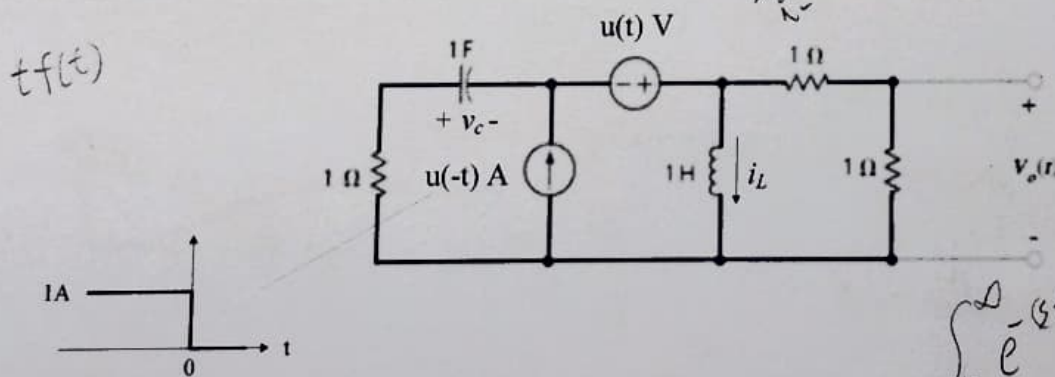


Fig. 1

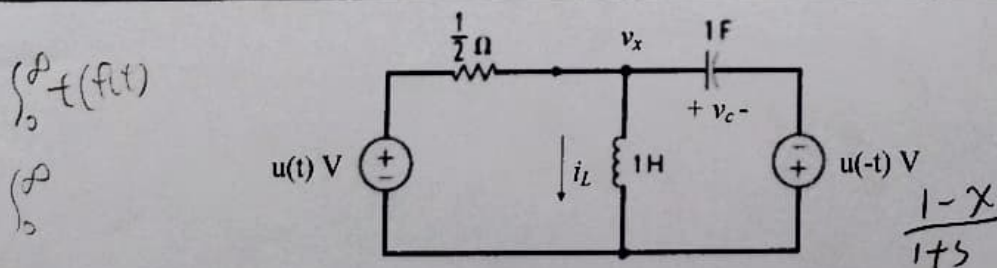


Fig. 2

$$s^2 - 1 \sqrt{\frac{2s+1}{s^2+2s+1}} \quad 17 \quad \frac{L}{s-1}$$